For producers of Sand nd Gravel, Crushed Stone, ement, Lime, Gypsum, and other nonmetallic minerals

JANUARY 1956

PIT and QUARRY

ANNUAL REVIEW & FORECAST ISSUE

Table of Contents, Page 2

Cement for Our Huge Construction Program—a Sixth Kiln Is Being Added to Permanente's Big Plant.

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Built with 3-T NYLON CORD plus EASY-MOUNTING TRU-SEAL RIMS

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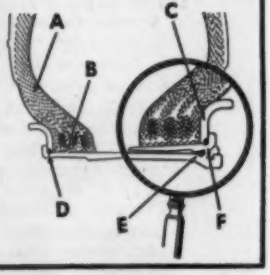
(C) Tru-Seal rim employs same general mounting principles as conventional rims.

(D, E, F) Tru-Seal rubber rings press into locking grooves, hermetically seal entire assembly—*automatically!*



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pit and quarry

THE BASIC MAGAZINE IN A BASIC INDUSTRY

JANUARY 1956—vol. 48, no. 7

Editorial: Another Record Year for the Pit and Quarry Field 2
Washington News Letter 12
News of the Industry 23
Convention Programs—N.S.G.A.-N.R.M.C.A., N.C.S.A., L.A.L.I. 26
Thirty Years Ago in Pit and Quarry 50
Screenings 80
Labor Developments 83
Good Neighbor Policy Pays Off for Bethlehem Limestone Company 90
Modernized Catskill Plant of Alpha Portland Cement 96
Kaiser Gypsum's Seattle Plant—Northernmost Link in a Chain 104
California Plant Produces Slurried Road Base Material 111
Don't Overpay Your Taxes! 112
Iowa Producer Straightens River to Obtain New Gravel Deposit 114
New Drilling Equipment Developed by British Anhydrite Mining Firm 116
Iowa Gravel Producer Erects Slackline Cableway System 120
Pacific Coast Aggregates Crushed Stone Plant Supplies San Francisco Bay Area 125
American Aggregates Opens Pushbutton Plant 128
1956 Review and Forecast 135
Quarry Modernization at Oriskany Falls Plant of Eastern Rock Products 172
Men of the Industry—A. R. Fisher and K. V. Lindell of Johns-Manville 178
New Slag Processing Plants Show Levy Company 5-Year Expansion 182

The Concrete Manufacturer

Editorial: Let's Get Behind and Push! 249
News of the Concrete Industries 251
Men of the Industry—President Earl W. Peterson 257
Convention Program, National Concrete Masonry Association 263
Southeastern, Texas Block Makers Hold Joint Session 268
Ready-Mixed Concrete Industry Shows Normal Annual Gain 281
Block Industry Passes Two-Billion Mark 284
Concrete Pipe Rides Construction Trend Upward in 1955 288
A Block Producer Talks to the Architect 289
Legal Aspects of Partnerships and Corporations 296

New Machinery 54
Industry Personalities 192
Obituaries 200
Legal Decisions 206
More Information Please 211
Manufacturers' News 224
Index to Advertisers 360

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B-1070

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You can't beat this combination . . . exclusive EASTON electric overhead dumping system and EASTON doorless pan trailer. Dependable dumping is the crucial factor in all modern mine and quarry transportation.

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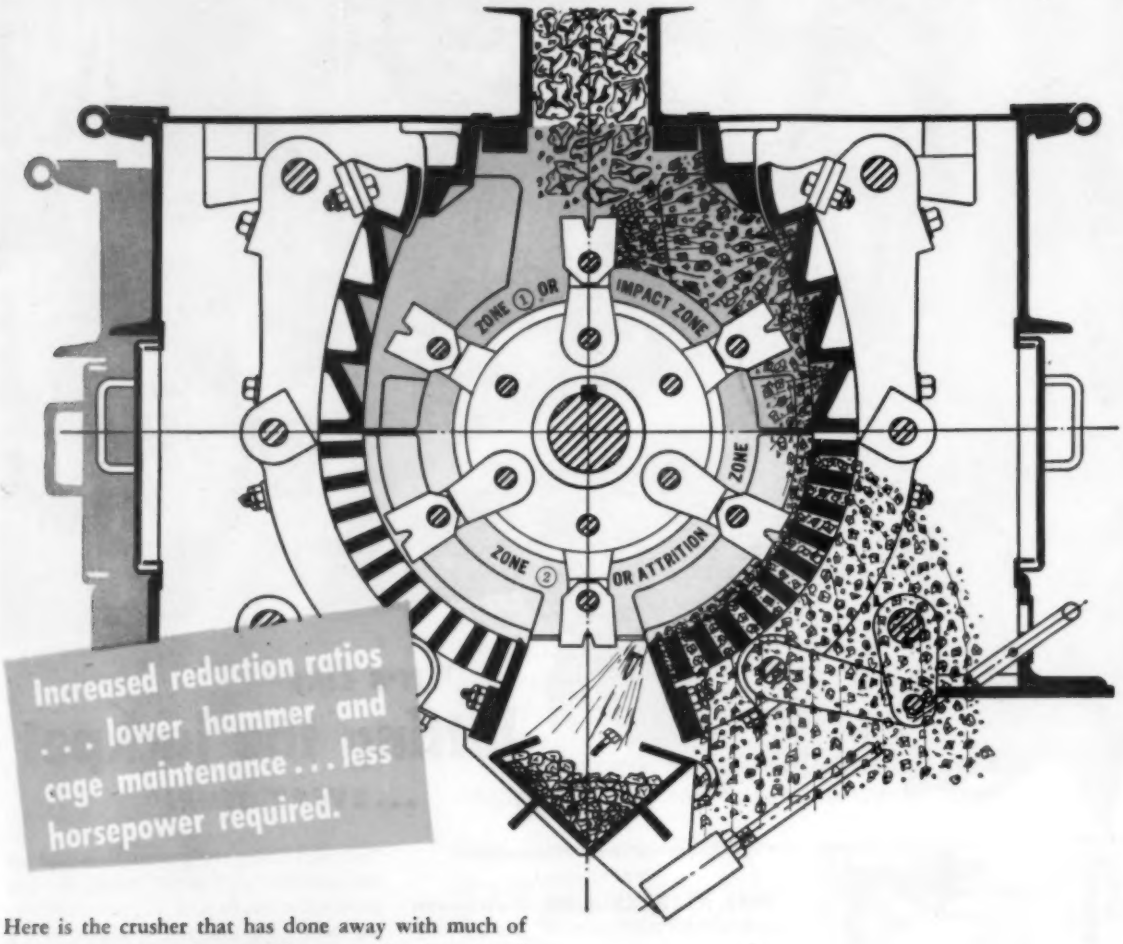
Your money is saved (or lost) *at the dumping point.* For the most efficient system you can own get the advantages of EASTON's exclusive background of experience and the EASTON automatic electric overhead hoist. EASTON trailer capacities range from 10 to 36 tons.

THE HAMMERMILL THAT CUTS PARTS WEAR WAY DOWN

The PENNSYLVANIA REVERSIBLE HAMMERMILL


ZONE ① OR IMPACT ZONE
ZONE
ZONE ② OR ATTRITION
Increased reduction ratios . . . lower hammer and cage maintenance . . . less horsepower required.

Here is the crusher that has done away with much of the wear on screen bars and hammers that is expected in hammermills of conventional design. Examine the illustration above. Note that most of the size reduction takes place in the upper or impact zone by free air impact, without any attrition action. Only when particle size is greatly reduced does material being crushed reach the attrition zone where hammers force feed through the cage bars to give a uniform sized product. Thus attrition and wear is held to a minimum. Then too, the reversible feature doubles hammer life and eliminates down time and labor cost of turning hammers. Ask for Bulletin No. 1034 that gives complete details.

PENNSYLVANIA CRUSHER DIVISION
Bath Iron Works Corporation • West Chester, Pa.

PENNSYLVANIA

Thousands of crusher installations plus 50 years experience designing and developing size reduction machinery makes our engineering staff an outstanding group to consult with on crushing problems.

PE-208

If your business is ROCK- here is the shovel you need!

HERE is another Model 41 Shovel in quarry work. This machine is in the pit of the Alexander Stone Co., Inc. at Marion, Ky. Remember the Model 41 Northwest is a real 1 yd.—built as a 1 yd. from the ground up for 1 yd. service and capable of the output and digging ability you expect from a 1 yd. machine.

Northwests have the stamina for mining operations like this. The Northwest Dual Independent Crowd utilizes force most other independent crowds waste, giving the extra push for hard rock work. The "Feather-Touch" Clutch Control makes operation easy without pumps, compressors, valves or tubing. The Cushion Clutch eliminates overloads before they can damage operating machinery. Cast steel bases and machinery side frames take the shocks of rock digging. Uniform Pressure Swing Clutches eliminate the jerks and grabs that make spotting heavy loads difficult. These and many other Northwest advantages combine to make the Northwest a *real* Rock Shovel.

If you have a rock problem you need a Northwest. Why not talk over placing an order. Get the full story.

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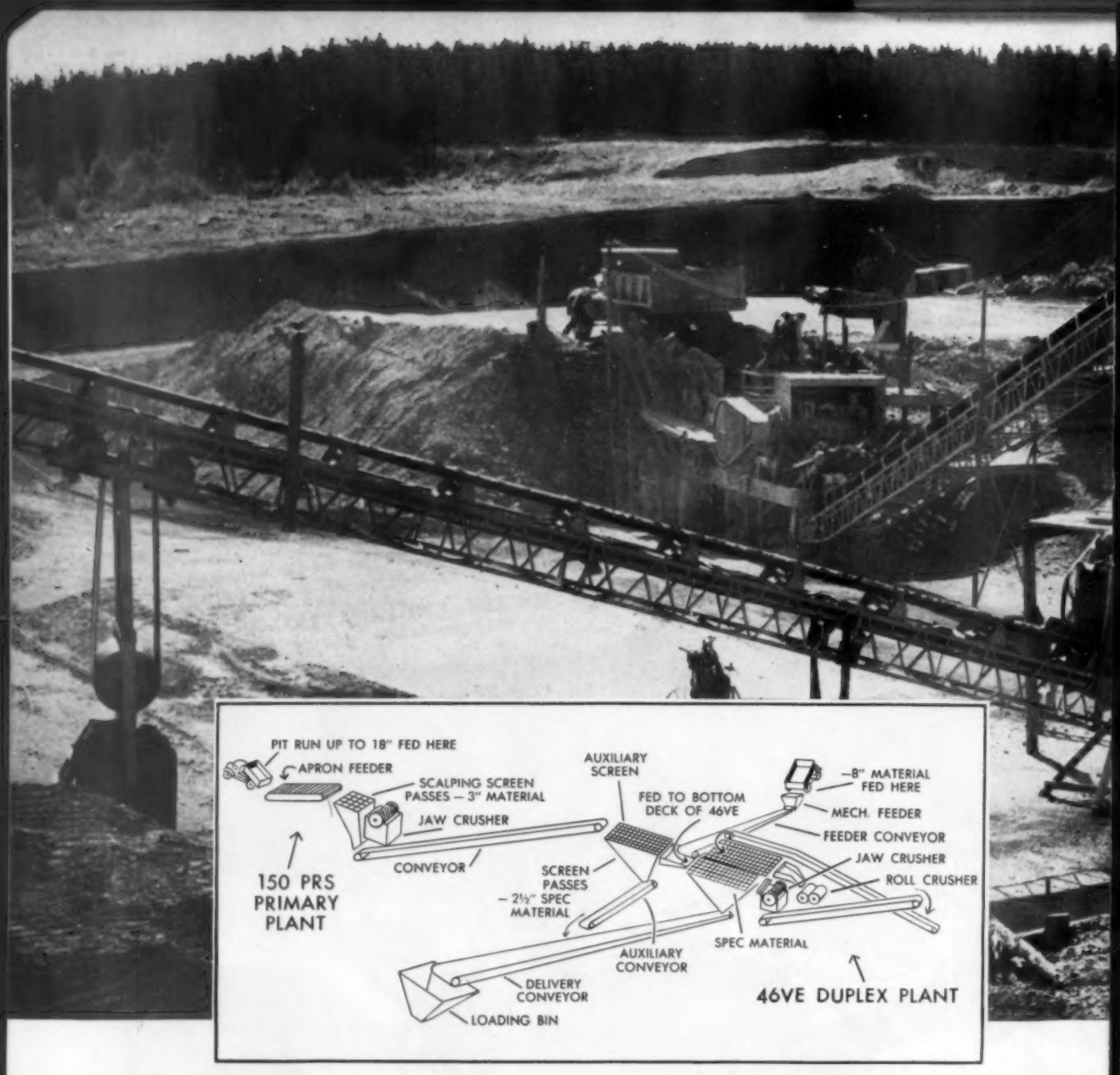
SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

Convertible for any Mining Material Handling or Excavation Problem



Portable crushing setup produces 5000 tons per day under freak pit conditions

● 5,000 tons is a lot of 2½" material to produce in a 10 hour day. And when you have to crush approximately half of it, you've got a job on your hands.

This was the task confronting Dexter Construction Company, which had contracted to supply material for all the roads at Canada's largest Army Base, located at Gagetown, New Brunswick.

Contractor finds freak pit conditions

Dexter found that half their pit consisted of material ranging from sand to 8" rock. This was swell, but to their dismay, they discovered that the other half contained a high percentage of 15" to 18" boulders. These could not be crushed with Dexter's presently owned equipment, yet in order to maintain road building schedules, *all* pit material had to be used. The problem was how to obtain the fastest, most economical production.

How the problem was solved

Dexter overcame this threatened production bottleneck by installing *two* portable crushing plants. One, a PIONEER Model 150 PRS Primary plant handles material from the part of the pit which contains the boulders.

The other, a big PIONEER 46VE diesel-electric Bottom Deck Feed plant, takes the 8" maximum material from the remainder of the pit *and at the same time, serves as a secondary plant for the 150 PRS.*

By an ingenious arrangement of materials flow, output of *both* plants is delivered to a common loading point via the same 36" x 105'

PIONEER Conveyor.

Working in conjunction, these two plants utilize all pit material and produce the necessary 5,000 tons in a 10 hour day.

Why the 150 PRS was chosen

After careful study, Dexter picked the 150 PRS for the job because its scalping screen and big 2036 jaw crusher enables it to handle large rock and at the same time, maintain unusually high output. The two-deck screen located ahead of the jaw crusher, removes material under 3" so that the jaw handles only rock needing primary crushing.

How these plants team up

Crushed material from the jaw in the 150 PRS primary plant, plus the by-passed materials, are separated and sized by a 5 x 12 two-deck auxiliary screen located between the two plants. Specification material is removed here and conveyed to the loading bin.

Material in need of further processing is then fed to the *bottom deck* of the 46VE *along with pit run material containing the 8" maximum rock.*

How Bottom Deck Feed works

With bottom deck feed, specification sizes are immediately removed. Oversize goes to the jaw crusher, then to the top deck where specification sizes are again removed. Oversize from the top deck is sent to the roll crusher for final reduction. This exclusive Bottom Deck Feed feature provides *twice* the effective screen area and thereby increases output. In addition, the operator can easily equalize loads carried by the roll and jaw crusher, *while the plant is operating,* thus always keeping the plant at peak crushing capacity regardless of changes in size of materials. This feature also permits closer gradation control.

For information on PIONEER's new Model 150 PRS Plant and 7 different sized Bottom Deck Feed Plants, write Pioneer Engineering Works, Inc., Minneapolis 13, Minnesota (a subsidiary of Poor & Company, Chicago).

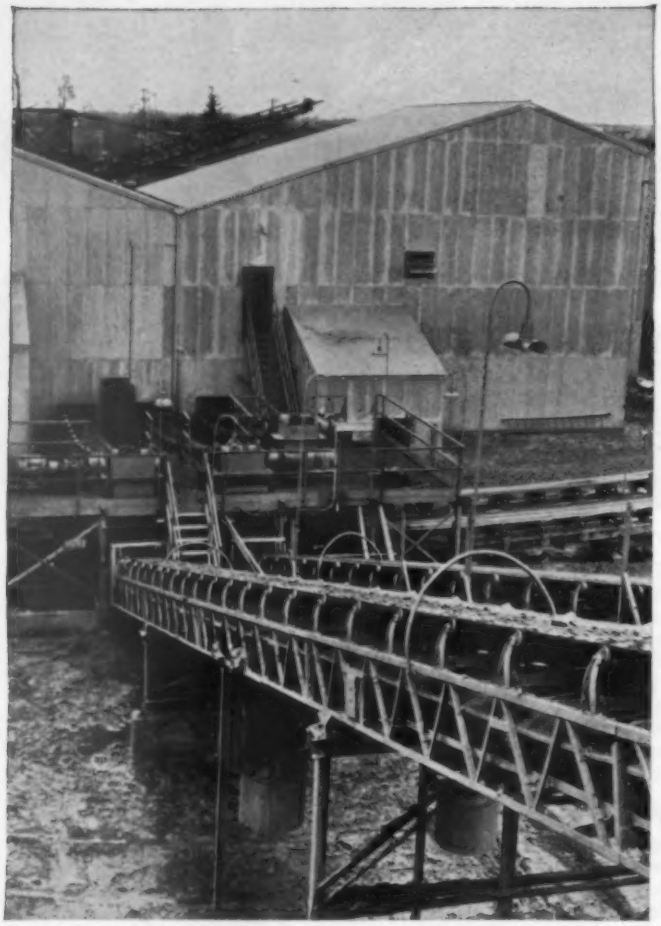
Pioneer
Continuflo EQUIPMENT

LOWER COST PER TON-MILE

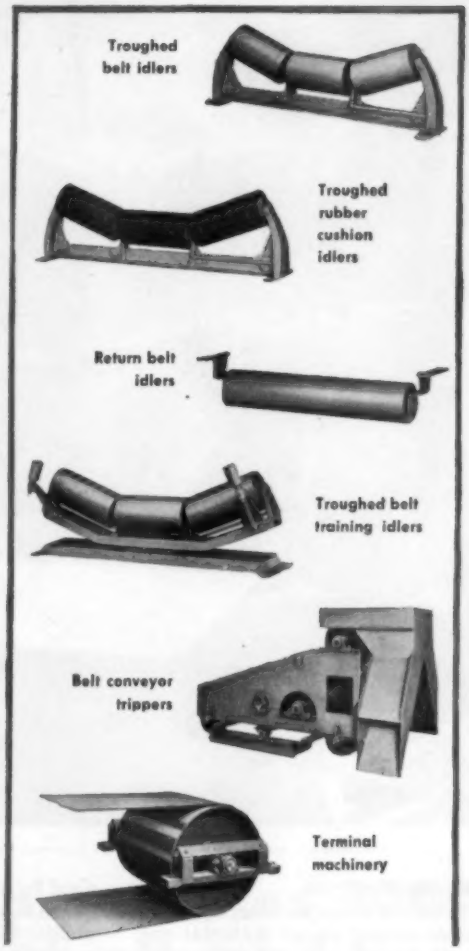
. . . yours with either a Link-Belt single belt conveyor or complete system

WHETHER you need a single belt conveyor or complete system, you'll find that Link-Belt engineering and equipment add up to lower cost per ton mile. Drawing from vast experience, our engineers can develop a system incorporating the most practical components from our complete line of quality idlers, trippers, drives, terminal machinery and other items. And if desired, we will handle erection.

Link-Belt has pioneered the development of belt conveyors for short or long hauls . . . indoor or outdoor service. To learn how this background can produce utmost economy per ton-mile in handling your bulk material, call your Link-Belt office.



Link-Belt 30-in. wide belt conveyors handling iron ore concentrate and tailings from washing plant to railroad and truck loading hoppers.



Link-Belt offers you one source for all equipment—including 500 idler sizes in 35 types . . . plus pulleys, drives, trippers and supports. Whatever the weight of loads, atmospheric factors or other operating conditions, you're assured of the easiest and most practical integration of belt conveyors into your overall system requirements.

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Visit our Booths 334-342—National Sand & Gravel Assn., Coliseum, Chicago, February 13-16

. . . all shaken up over screening problems?

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Remember, Deister's exclusive Opposed Elliptical Throw, Unitized Life-Time Vibrating Mechanism, and Adjustable Screen Panels at feed and discharge end, were designed and developed by Deister sizing and separating experts . . . men who specialize in giving the industry exactly what it wants and needs.

There are Deister models and sizes to meet every screening requirement. Write Deister today for their data sheet . . . with complete information on your particular screening problem, Deister engineers can recommend a screen to handle your job better.

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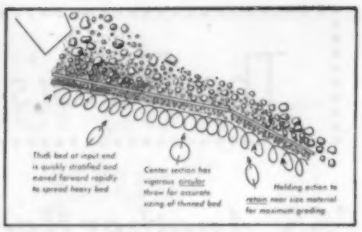
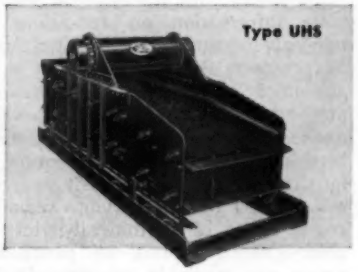
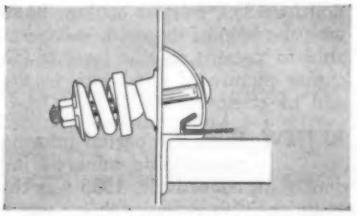

Thick bed at input end is quickly stratified and moved forward rapidly to spread heavy bed
Center section has vigorous circular throw for accurate sizing of thinned bed
Holding action to retain near size material for maximum grading

OPPOSED ELLIPTICAL THROW

Deister's exclusive powerful throw action provides more capacity per square foot. Movement of material on the screen is controlled accurately, for the greatest speed and efficiency in sizing.

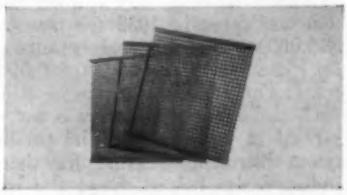


Side tension screen featuring adjustable slope panels. Divided screening sections, identical in size, permit shifting to distribute wear. 1, 2 or 3 decks in sizes up to 6' x 16'.



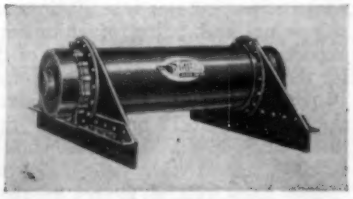
POSITIVE SCREEN CLOTH TENSIONING

Powerful tension springs hold screen cloth (either with hook strips of clamping angles) in tension over series of cross members arranged in arc. Positive tension, plus curvature, prevents whipping.



DIVIDED INTERCHANGEABLE SCREENING SECTIONS **(On the Type UHS)**

Sections are identical in size; may be readily interchanged or shifted, to distribute normal wear and prolong life of screening medium. Any screen may be changed without disturbing others.



UNITIZED LIFE-TIME VIBRATING MECHANISM

Entire mechanism is precision-constructed, jig-assembled unit—demountable and readily interchangeable—and mounted well above heat, grit and dirt. Renewable sleeves prevent wear on bearing housings and shafts. Oil-bath operation.

The Editor's Page

'55, Another Record Year for the Pit and Quarry Field

IN this January, 1956, Annual Review and Forecast Number of PIT AND QUARRY we are again attempting to provide our readers with the latest and most complete information on conditions in the nonmetallic minerals industries, on developments affecting them, and on prospects for the future. As in past years, we have assembled all available information from government and other sources, from our own records, and from answers to a questionnaire sent to thousands of producers in this field. This extensive survey was made necessary by the fact that government figures have fallen behind even farther than in previous years, and results from the recent census of the mineral industries are not yet available. Official reports on production, shipments, and prices are available on only six industries (including cement, lime, and gypsum) for even a part of 1955; complete information for 1954 is at hand for only seven more; and on some there is not even complete information for 1953. In spite of these handicaps we believe that, with the help of the many co-operating producers, we are able to present in this issue a fairly complete and accurate picture of conditions in these industries in 1955 and of prospects for 1956.

REVIEW Even the partial information available on the nonmetallic minerals industries makes it evident that, collectively, 1955 was the biggest year in their histories. This record volume was again, as in preceding years, due largely to the increased construction volume which carried with it to new records the three largest industries in the field—cement, sand and gravel, and crushed stone—as well as some of the smaller industries.

Authoritative sources estimate that about $42,000,000,000 was spent in 1955 for new construction and about $15,000,000,000 for maintenance and repair. This was an increase of about $5,000,000,000 over the 1954 record total. The relative absence of strikes and car, material, fuel, and labor shortages was a contributing factor. The pickup in general industrial production and the consequent increased demand for those nonmetals used by industry also helped. Even the incomplete reports now available make it certain that the dollar volume of industrial production in 1955 exceeded the 1954 total by a considerable margin and probably also exceeded the 1953 all-time record.

The portland cement industry in 1955, for the ninth consecutive year, set new all-time records in production, shipments, and value of shipments. Bureau of Mines reports for the first ten months of the year and estimates for the remainder indicate that production was up about 10 percent, shipments about 9.2 percent, and the value of shipments about 12 percent over the 1954 record levels, to about 298,000,000 bbl., 298,500,000 bbl., and $848,000,000, respectively.

The latest official figures on the production of sand and gravel, crushed stone, and most other aggregates are for 1953, and for some even earlier. Answers to questionnaires sent to several thousands of established producers in all parts of the country have, however, provided us with fairly accurate information on the larger industries for 1954 and 1955. These figures prove beyond a doubt that these industries collectively set new records of production and value in 1955, as they had done in 1954. The production of sand and gravel, crushed stone, and lightweight aggregates each set new all-time records by considerable margins, and slag may also have done the same.

It is estimated that the sand and gravel industry in 1955 produced about 475,000,000 tons, about 5 percent over the 1954 record output (also estimated) of about 450,000,000 tons. These figures include both commercial and noncommercial production and industrial sand.

The crushed stone production in 1955 is estimated to have been about 316,000,000 tons, about 1 percent over the record 313,000,000 tons estimated to have been produced in 1954. These figures include both commercial and noncommercial production, as well as agstone, but not the stone used in cement and lime manufacture. The production of agricultural limestone is believed to have regained most of the volume lost in 1954 and is estimated at about 20,000,000 tons.

The slag industry, which in 1954 fell off to about 27,000,000 tons after its 30,000,000-ton record in 1953, apparently regained lost ground in 1955. The volume of production and sales of slag is dependent on the volume of steel production, which was not seriously affected by strikes during the past year.

The lightweight aggregates industries (including expanded clay-shale, expanded slag, pumice, perlite, etc.) continued their rapid growth in 1955. It is estimated that consumption for major uses alone totaled about 24,000,000 cu. yd., compared to the 17,500,000-cu. yd. record of 1954.

The production of other nonmetallic minerals as a whole possibly also broke records in 1955, but comparatively little information is yet available. Data for a part of the year indicate probable new records for lime, gypsum, phosphate, and potash, a possible record for sulphur, and increases in some others.

FORECAST Forecasting business conditions is always a gamble, but many authorities have definitely committed themselves to predictions that we have several years of increasing construction volume ahead of us and that the cement industry by 1957 will have enough capacity to meet the demand. Business and industry in 1955 more than regained the slight loss in 1954, led by steel and department store sales, and some further gains are expected. The stock market is at a record level which reflects the general spirit of optimism. Everything points to new records in 1956 for the cement and aggregates industries, as well as for some other nonmetallic mineral industries, which should carry the field to a new collective high.

Walter E. Trauffer

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Lubricate engines with one of the famous *Texaco Ursa Oils* and you'll get constant full power on any job, *plus*:

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Washington News Letter

WASHINGTON is now going through the "groping stage" of the pre-election period. Particularly because the President's illness has postponed decisions of potential candidates, many persons who have a stake in the forthcoming election are spending their time looking around for the winning issue.

The Republicans, of course, think they have it in the form of "peace and prosperity". Normally, this would be sufficient to win almost any election. Why then do they seem to be so worried? Why does the thought that President Eisenhower may not be able to run again produce so many cold shivers?

The answers, of course, are found in the fact that no one seems to feel sure that either the peace or the prosperity is stable enough to last even until next November. With regard to peace, the uncertainty is even greater than with regard to prosperity. This fact probably flows from the feeling that if prosperity were to slip a little, there are many things that the Administration could do to change the situation. But if peace seems to be slipping away, the Administration may not be able to do more than wait helplessly and hope.

The fiascos of recent international conferences bear uncontrovertible testimony that the United States is not the complete master of its own fate in the issues of peace and war. To the politician who knows that a large part of the President's victory in 1952 was due to his promise to end the Korean conflict, the border squabbles in the Middle East are no academic matter. While they would prefer it otherwise, the State Department and the Administration have long recognized that the United States can not long remain neutral in any conflict the world over.

Thus, perhaps more than anything else, the continuing imminence of widespread conflict is worrying not only the policy-makers but others well down the line. As an issue in the campaign, however, nothing short of direct involvement—sending our boys overseas—is likely to have any great influence. As the politicians see it, the public appears to have become so accustomed to ups-and-downs in our international relations, particularly our relations with the Russians, that it no longer regards any situation as serious.

The Republicans may be expected to do everything they can to keep the international situation as quiet as possible. There is no guarantee that they will be able to succeed. The Democrats are in a position where the best they can say is that they can do it better. This is reminiscent of the 1948 Dewey campaign, which certainly provided no formula for success.

However, on the issue of prosperity, everyone begins to feel himself on more solid ground. The difficulty is that there is no real issue. What has been demonstrated since the end of World War II is that prosperity can abound under any Administration.

The suspicion is beginning to dawn that the question of whether we have prosperity or not is more in the hands of the people than of the politicians, and that what the Republicans have done and would do to maintain prosperity is just about what the Democrats have done and would do.

It is now generally accepted that the principal force behind the prosperity of the last year was the consumers' willingness—even *desire*—to spend virtually all of his income on goods and services. The willingness of producers to spend increasingly more on new plants and facilities is likely to maintain prosperity for the next year. If these two forces slow down, prosperity is impaired.

During deep depression the government was forced into a very active role. In maintaining high prosperity, government's role appears to be quite subsidiary to that of either consumers or producers. At the moment, it is doing nothing more than trying to prevent excesses—particularly excessive credit expansion which would lead to inflation. A false move, even in exercising this function, can get an Administration into much trouble. The 1953 business slowdown is now generally blamed on the excessive anti-inflationary zeal of many of the new Republican office-holders.

But what kind of issue can the Democrats make of this? They can't even argue too cogently that they could do it better. While the current prosperity still leaves many individuals and groups at less than desirable levels, little more can be done with the present condition of the nation's industrial plant. It is working at capacity. All the goods and services that can be produced are being made, and they are being distributed. New capacity is being built about as rapidly as that can be done. When that is available, more wants can be satisfied.

Therefore, the search for issues boils down to a search for malcontented groups. The farmers are the largest such group, and no stone is being left unturned to disenchant them with the present Administration. Small businessmen, particularly those who have a grievance against big businessmen, are being sought out, and Congressional committees are giving them a platform to air their grievances. Scandals among the Republicans are being uncovered, so that the "corruption in Washington" issue can be made bi-partisan.

Finally, labor is being reminded that, traditionally, Republicans have not been their friends, although it is hard to find direct evidences of hostility, at least, on the part of the present Administration's officials who are charged with responsibilities toward labor.

However, none of these issues seems to have "caught on", and the search continues.

Should the President be able to run, the issues will probably again become subordinated to the man. Should he not be able to run, the absence of other issues may, nevertheless, require that the final outcome will depend primarily on the man.

Overseas Caterpillar Plant Producing Earthmoving Units

The first earthmoving machine manufactured overseas by the Caterpillar Tractor Company has come off the assembly lines in Australia.

Caterpillar No. 12 Motor Graders made by Caterpillar of Australia Pty. Ltd., a recently established subsidiary of Caterpillar Tractor Co., and other Caterpillar products are now in production. No. 212 motor graders, No. 46, 44, 41 hydraulic controls, No. 30, 29, 27, 25, 24 cable controls, No. 8A, 8S, 7A, 7S, 6A, 6S cable bulldozers, No. 2A, 2S, 4A, 4S, 6A, 6S hydraulic bulldozers and No. 2 and No. 4 tool bar, are also in the manufacturing stage.

Pending completion of a new plant in Melbourne, the equipment is being assembled at Steelweld Pty. Ltd., Braybrook, Victoria. Ground breaking ceremonies for the new plant have already taken place.

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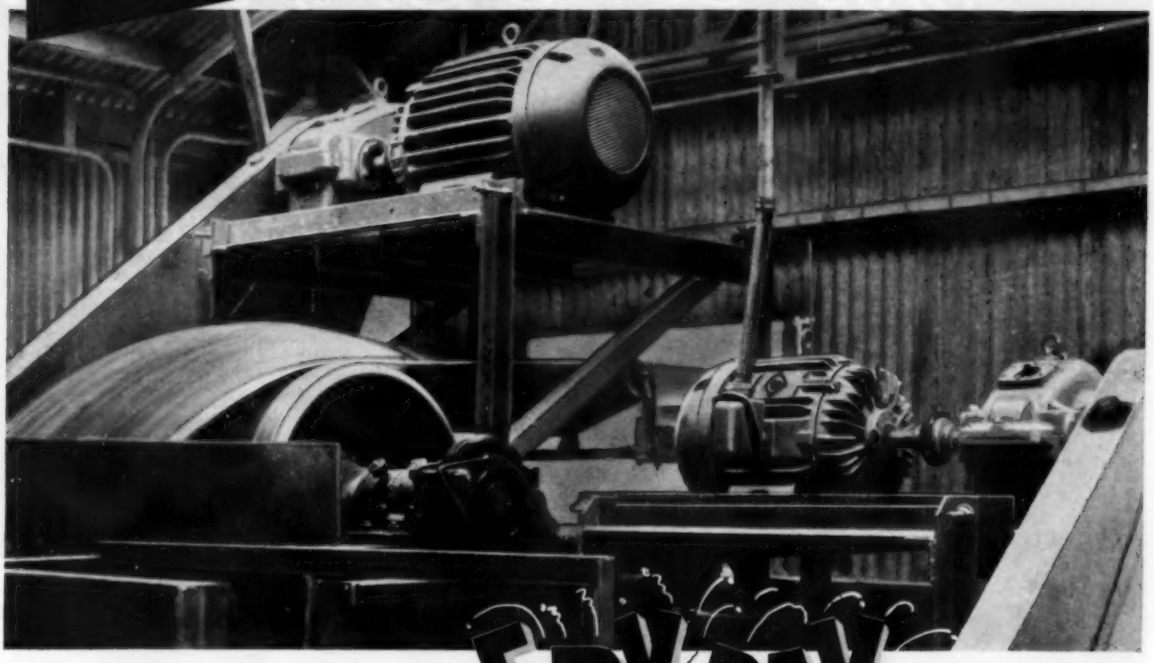

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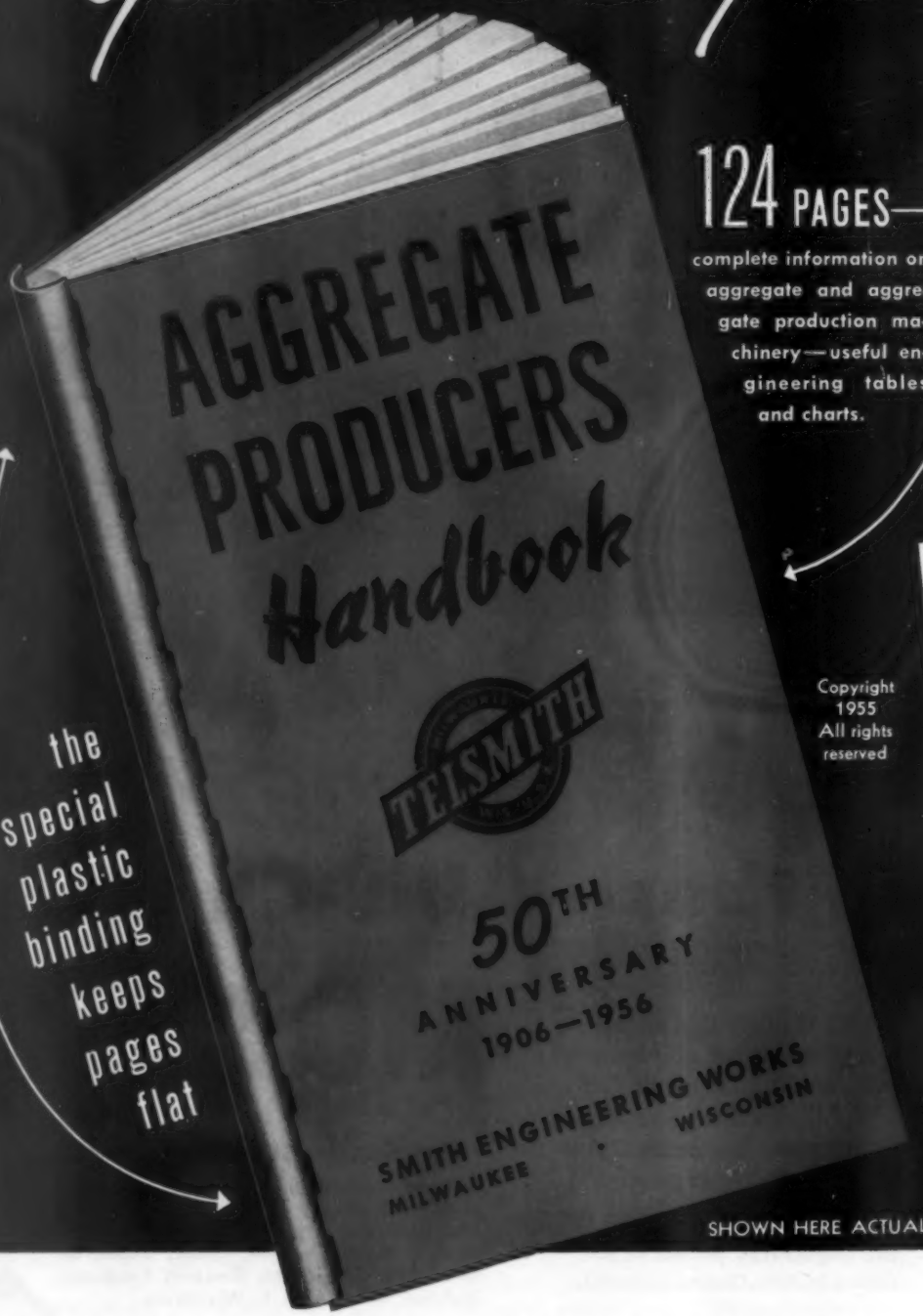

124 PAGES—
complete information on aggregate and aggregate production machinery—useful engineering tables and charts.

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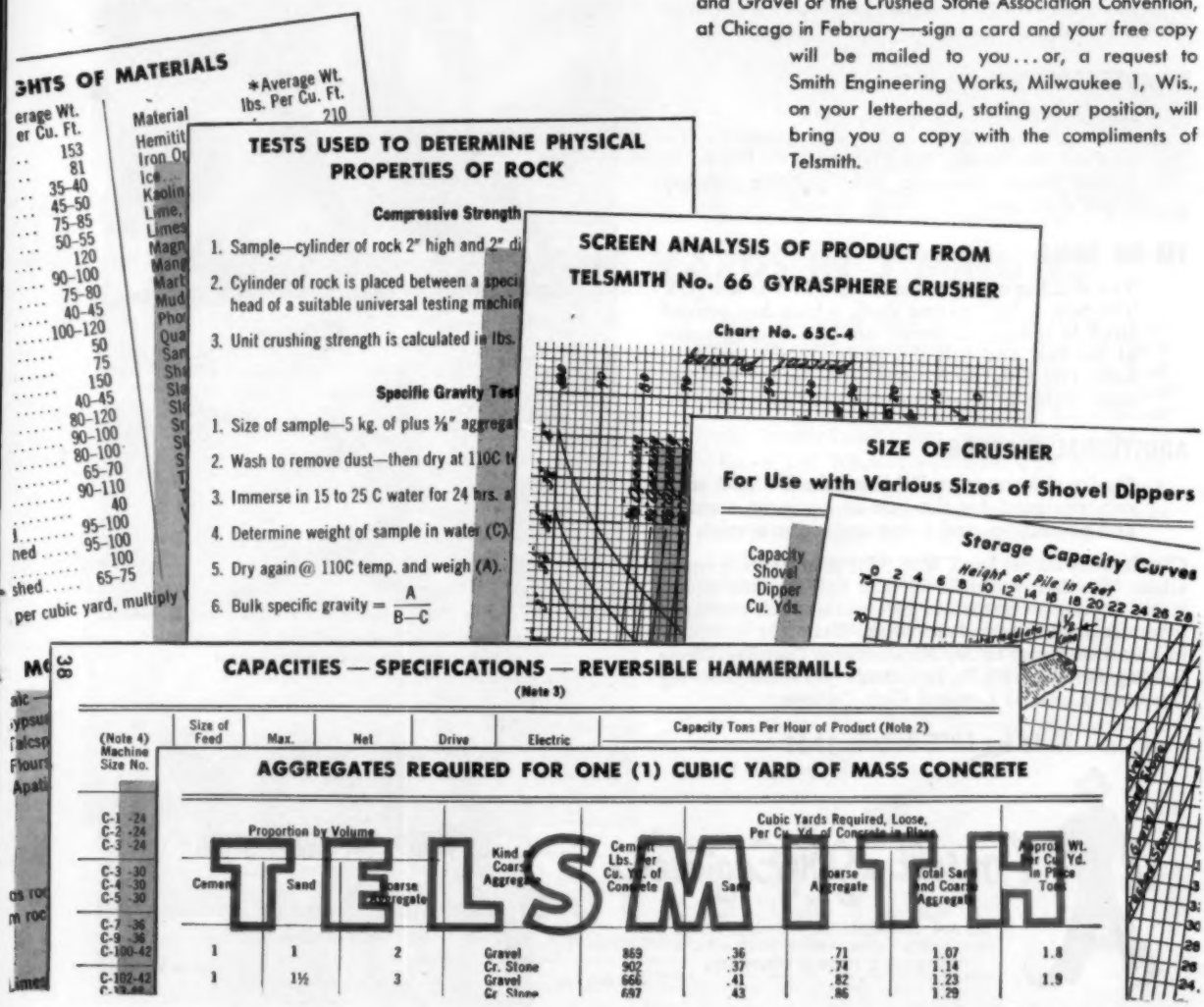
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SCREEN ANALYSIS OF PRODUCT FROM TELSMITH No. 66 GYRASPHERE CRUSHER
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The TWM-5 is self-propelled on either rubber tires or crawler treads. It is driven on each side by a reversible piston type air motor, can turn in its own length, and can move into and out of most "tight" spots.

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The drilling machine on the TWM-5 is the JOY TM-500, a 5¼" piston drill, which has proved itself in quarry, construction, and mining work as the first and still the leader in the big drill field. The TM-500 is mounted on an extra sturdy mast which is raised and lowered hydraulically.

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Optional features available on the TWM-5 are a cab, designed for the best in operator comfort and protection, and a dust collection system.

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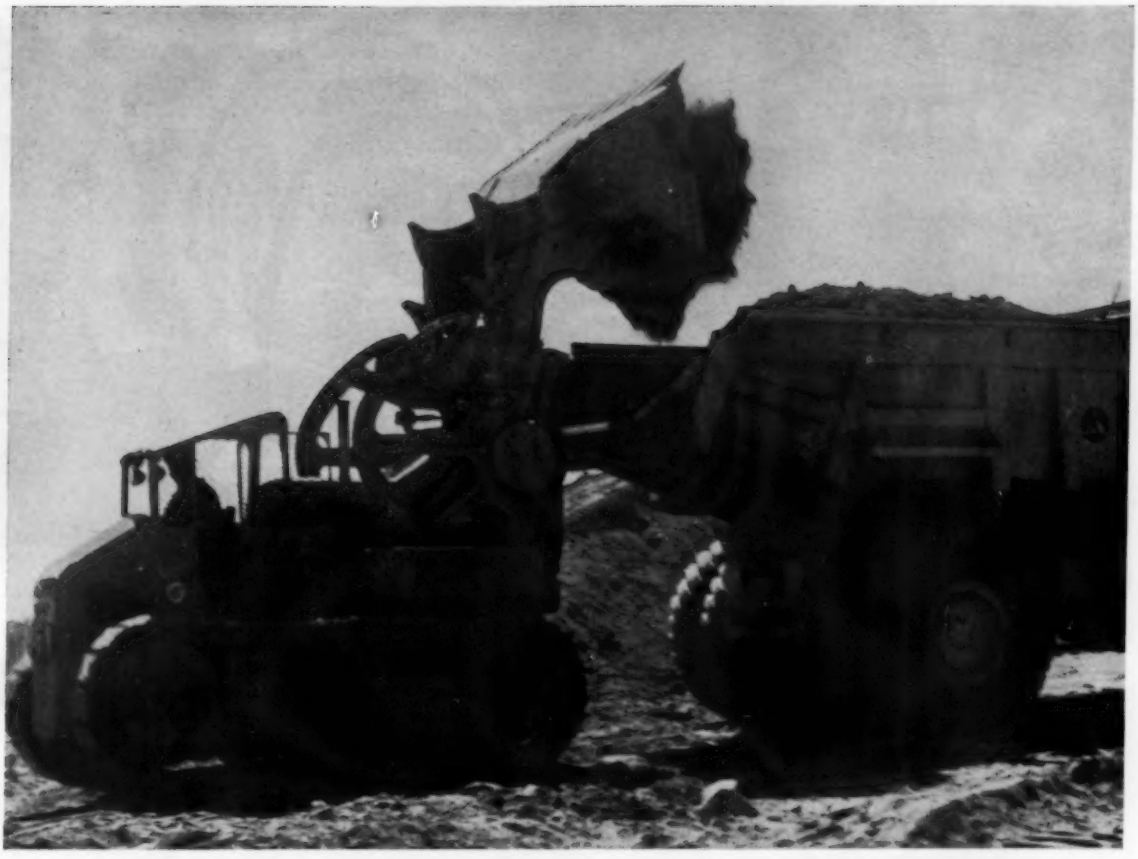

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The 105 loads from the end of the truck or from the sides depending on the truck driver's approach to the loading point. On this job, 6 of these trucks are kept busy on the short run and each of the trucks cost more than the efficient Eimco Tractor-Loader that keeps them loaded.

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B-199

F-100 8-ft. Pickup—GVW 5,000 lbs.

T-800—GVW 42,000 lbs.; GCW 65,000 lbs.

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Ford Trucks for '56 save you money right from the start. And, they keep on saving with their extra-sturdy, long-life engine design.

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Ford's long-lasting engine design pays off for you in every way. You save money on parts replacements such as piston rings and bearings. You save on shop labor—extend time between preventive maintenance jobs like valve adjustments, valve grindings, compression tests, ring jobs and the like.

And you can save on driver costs if you can keep trucks out of the shop and on the road. Yes, you save in every way when you get more work done per truck!

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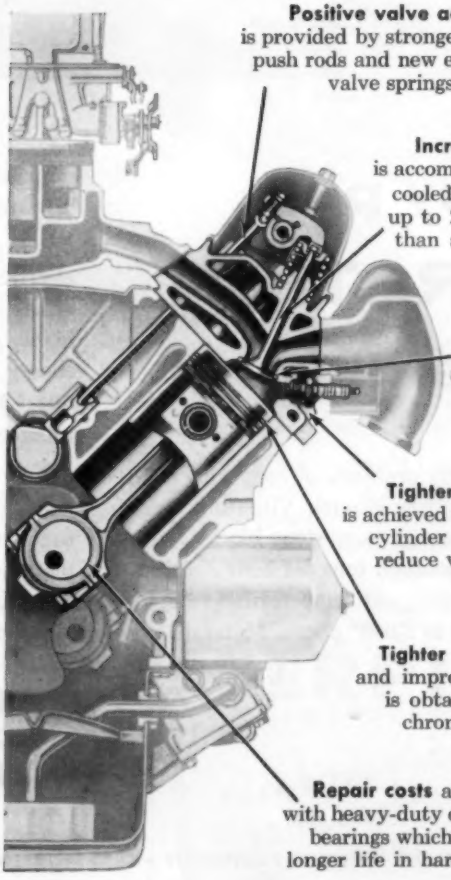
You have new engine advancements for longer life (some explained and illustrated at the right).

New high-capacity tubeless tires, heavy-duty 5-speed transmission and Power Steering are standard equipment, at no extra cost. Two 3-speed auxiliary transmissions and full-air brakes are available at low extra cost.

New *Driverized* Cabs for driving comfort and convenience have *Lifeguard* Design safety features found in no other truck. Lifeguard steering wheel helps protect driver from steering column; Lifeguard door latches help keep doors from jarring open in case of accident.



Positive valve action is provided by stronger, tubular push rods and new equal-coil valve springs.

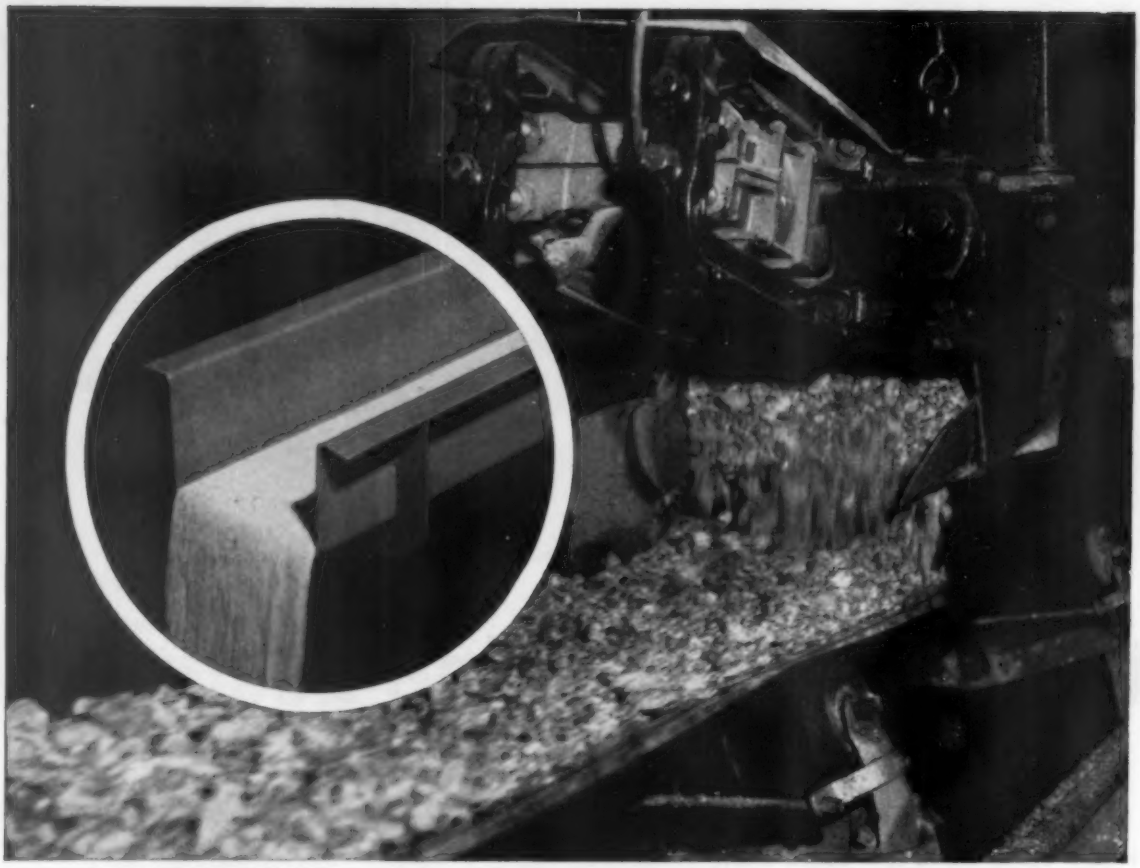
Increased valve life is accomplished with sodium-cooled exhaust valves—up to 225° cooler-running than solid-stem valves.

Longer valve and seat life are the result of solid tungsten-cobalt alloy facings and exhaust valve seat inserts.

Tighter valve closing is achieved with stress-relieved cylinder heads that help reduce valve distortion.

Tighter compression seal and improved ring durability is obtained with thicker chrome-plated rings.

Repair costs are lower with heavy-duty copper-lead bearings which provide longer life in hard service.



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Jeffrey's years of experience with conveying prob lems enable us to furnish systems exactly right for each particular task. Catalog 870 describes the complete line of Jeffrey Vibrating Equipment. For a copy, and for help on your conveying problems, write The Jeffrey Manufacturing Co., Columbus 16, Ohio.

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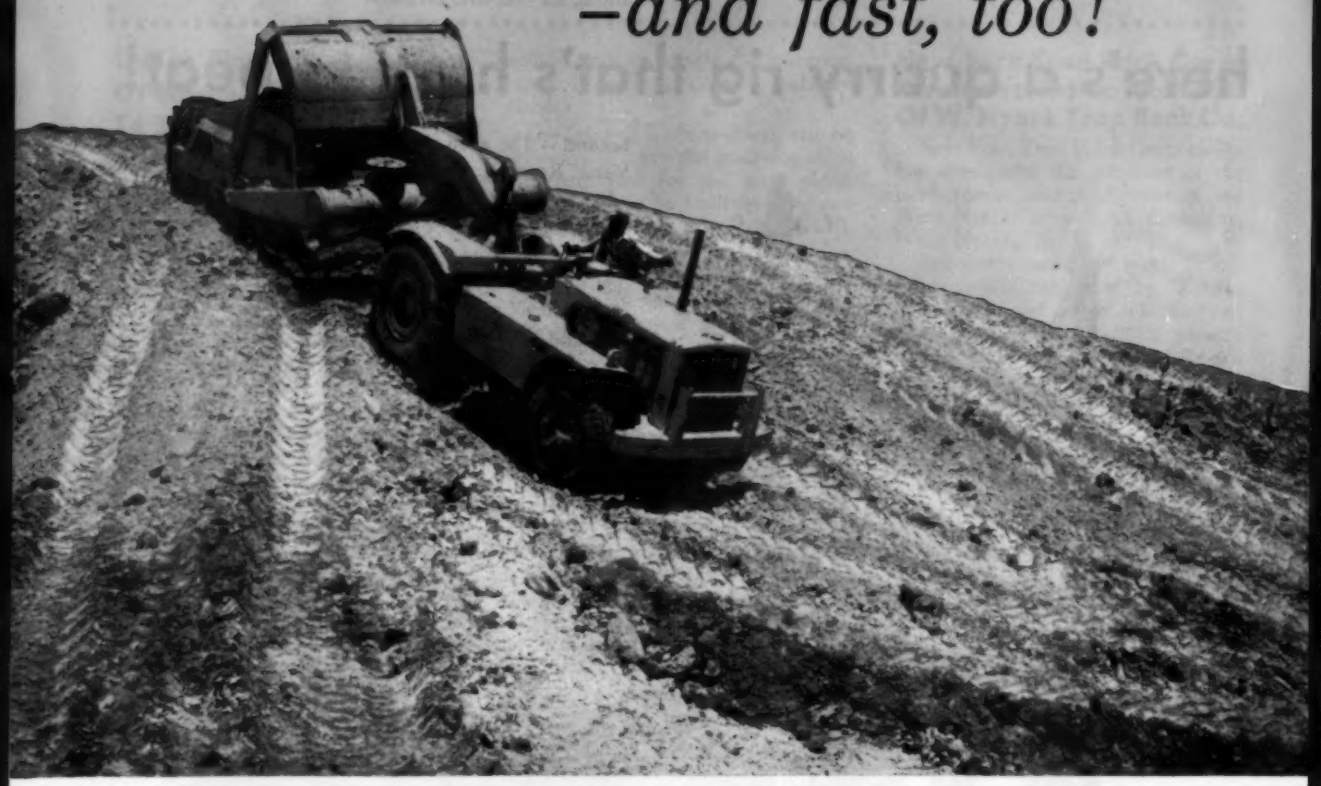

THAT'S the verdict of Ed Walker, job super for H. G. Cozad Construction Co., on a job near Roff, Okla. This agile CAT* DW15, shown with No. 15 Scraper, had just been driven 90 miles in three hours from a shut-down job to this one!

The Caterpillar DW15 is stripping clay overburden so that sand can be quarried for the Roff plant of Mid Continent Glass Co. The big yellow machine works 10 hours a day, six days a week, with time out only for bad weather. According to Ed Walker, "There just isn't any other equipment like Caterpillar machines. They move a lot of dirt without giving us any trouble."

H. G. Cozad is 90% standardized on Caterpillar. In addition to this DW15, the firm owns two Cat DW21s and three DW10s with scrapers, seven Caterpillar track-type Tractors, and a No. 12 Motor Grader. About two-thirds of the equipment is on this job, moving 6000-7000 cu. yd. of overburden per day over a quarter-mile haul.

That's high production, especially with a 100-ft. unfavorable grade on the haul road. The fast-moving DW15 can highball at speeds up to 24 m.p.h. for fast cycle times. Its four-cycle Caterpillar Diesel Engine develops 186 HP, and puts out maximum torque when slugging through tough going with heavy loads. Its companion No. 15 Scraper has a capacity of 15 yd. (heaped), and features fast loading with a live, "boiling" action, and positive ejection of sticky materials.

There's a full line of rugged, fast-working Caterpillar rubber-tired Tractors and Scrapers. Your Caterpillar Dealer – who provides fast service and parts you can trust – will gladly demonstrate the unit best suited to your needs.

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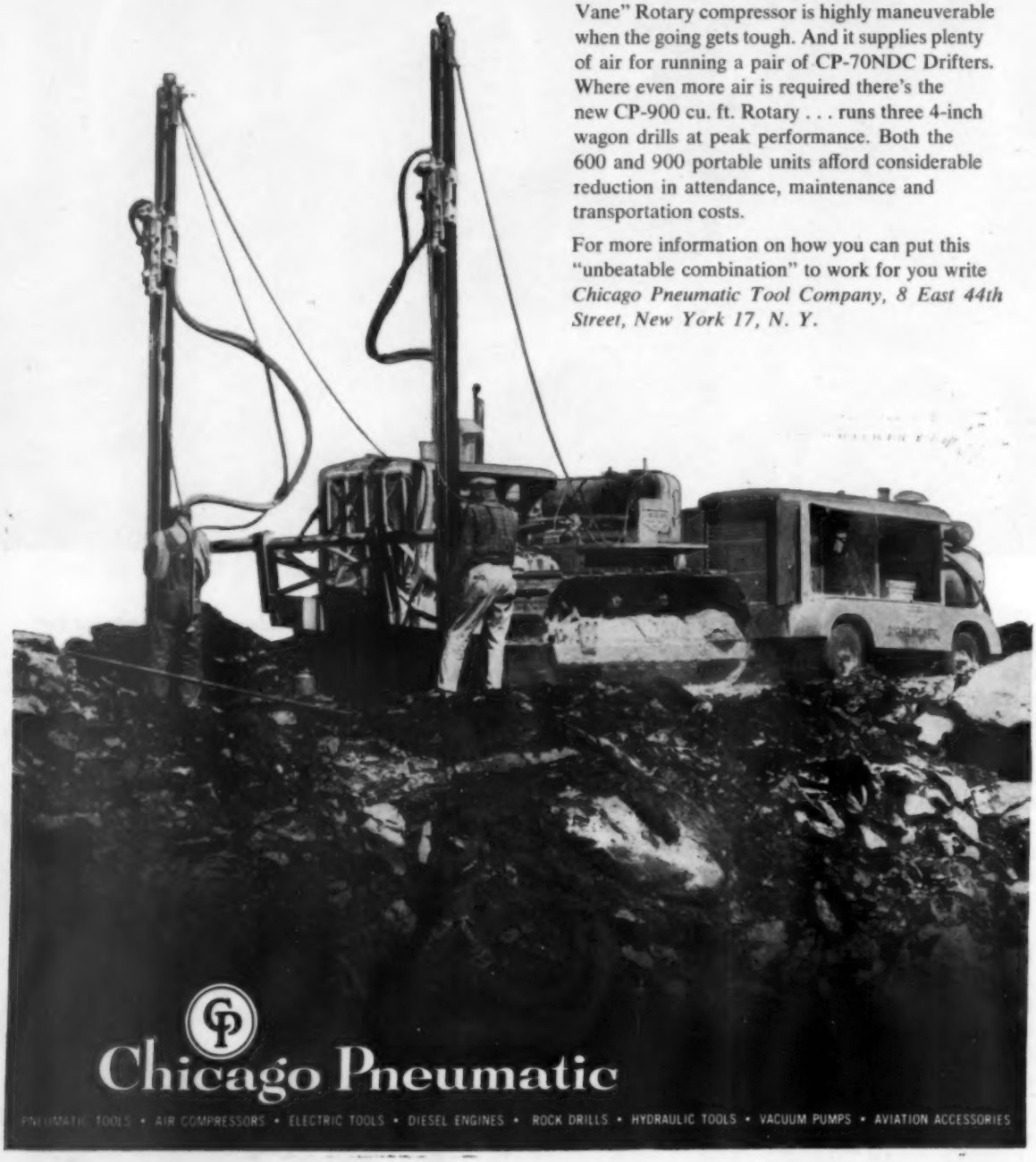
Here are two good reasons why the smart mid-west quarry that assembled this mobile drilling unit is getting tops in drilling efficiency and economy:

First – The two CP tubular drill carriages mounted on front of the tractor provide extra long feed and all the rigidity necessary to stabilize two hard hitting CP-70NDC Drifters.

here's a quarry rig that's hard to beat!

Second – The easy-towing 600 cu. ft. CP "Power Vane" Rotary compressor is highly maneuverable when the going gets tough. And it supplies plenty of air for running a pair of CP-70NDC Drifters. Where even more air is required there's the new CP-900 cu. ft. Rotary . . . runs three 4-inch wagon drills at peak performance. Both the 600 and 900 portable units afford considerable reduction in attendance, maintenance and transportation costs.

For more information on how you can put this "unbeatable combination" to work for you write *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.*



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News of the Industry

Lehigh Plans Expansion Of Mason City, Iowa, Plant To 3,000,000-Bbl. Output

Officials of the Lehigh Portland Cement Company have revealed plans to expand the capacity of the firm's Mason City, Iowa, plant by 1,000,000 bbl. annually. The announcement was made by Joseph S. Young, president.

The expansion program, the second for the plant since the end of World War II, is expected to be completed by 1957, and will increase production to approximately 3,000,000 bbl. annually.

Enlargement of the Mason City plant, Mr. Young stated, will be carried through without interference with current output. Furthermore, he said, it will in no way curtail the company's efforts to find an adequate supply of the proper kind of raw materials to justify the erection of a new cement plant in Minnesota, as close to the Twin Cities as possible.

Other Lehigh plants which have been expanded since the close of World War II or are presently being expanded are those at Metaline Falls, Wash., Fordwick, Va., Alsen, N. Y., Bunnell, Fla., Union Bridge, Md., and Buffalo, N. Y. By the end of 1957 the Lehigh Portland Cement Company will have spent more than $122,000,000 for added capacity and rehabilitation in its post-war expansion program.

National Gypsum Selects Site For Multimillion-Dollar Plant

Announcement was made recently by National Gypsum Company officials that the concern will construct a multimillion-dollar plant in Burlington Township, N.J., on the banks of the Delaware River.

Plans call for the erection of the plant, a wharf, and a dock for receipt of raw gypsum from Nova Scotia. The plant will turn out building products, and will use 350,000 tons of raw material annually.

The New Jersey plant is a part of the current $75,000,000 expansion program being undertaken by National Gypsum.

As construction of the plant progresses, three 15,000-ton cargo ships will be built to handle the transportation of rock to various seaboard plants.

Dredging of a channel will also be necessary to carry the sea-going ships supplying fuel for the new plant. The wharf, to be built in conjunction with the plant, will be 645 ft. long.

As the new cargo vessels deliver their raw materials, completely automatic unloaders will handle the rock, placing it on a 200-ft. conveyor belt which will transport the materials to the plant.

West End Chemical Discovers Deposit, Adds Rotary Kiln

West End Chemical Company has reported the discovery of a very pure lime rock deposit in the Argus Range, Inyo County, Calif.

West End plans to transfer its present quarry operations to the new site and install a rotary kiln, using natural gas as fuel. Capacity of the new kiln will be 170 tons per day.

Removal of the firm's offices to larger quarters was also announced. The new location is 1956 Webster Building, Oakland.

New York Trap Rock Corp. Purchases Entire Holdings Of W. Nyack Trap Rock Co.

New York Trap Rock Corporation has announced the purchase of the land, plants, and equipment of the West Nyack Trap Rock Company, West Nyack, N. Y.

Acquisition of the West Nyack property will replenish the 28,000,000 cu. yd. of stone which Trap Rock has quarried at its present plants since the war. Trap Rock's four quarries, located at Haverstraw, Tomkins Cove, Clinton Point, and Verplanck on the Hudson River, this year will have produced a total of 7,000,000 tons of stone products.

The newly-acquired property comprises over 150 acres, which includes 120 acres of stone-bearing land containing an estimated 25,000,000 yd. of trap rock. The plant has an annual stone-producing capacity of 500,000 tons. There are, in addition, plants for processing bituminous and concrete materials.

West Nyack employees will be under the direction of George O. Foster, superintendent, who was formerly assistant superintendent of the Tomkins Cove plant.

Coming Events

January 9-11, 1956—Birmingham. Operators' meeting, National Slag Association, Tutweiler Hotel.

January 11-14, 1956—Miami Beach. 54th annual convention and exhibit, American Road Builders Association. Municipal Auditorium.

January 23-25, 1956—New Orleans. 36th annual convention, National Concrete Masonry Association. Roosevelt Hotel.

January 24, 1956—New Orleans. Mid-winter meeting, The Expanded Clay and Shale Association. Roosevelt Hotel.

January 29-February 2, 1956—Chicago. 37th annual meeting, Associated Equipment Distributors. Conrad Hilton Hotel.

February 13-16, 1956—Chicago. 40th annual convention, National Sand and Gravel Association, 26th annual convention, National Ready Mixed Concrete Association, and combined exhibit. Headquarters, Conrad Hilton Hotel; exhibit, Coliseum.

February 15-17, 1956—Chicago. Annual convention, National Agricultural Limestone Institute, Inc. Blackstone Hotel.

February 20-22, 1956—Chicago. 39th annual convention and biennial exhibit, National Crushed Stone Association. Conrad Hilton Hotel.

February 27-March 2, 1956 — Buffalo. Committee week, American Society of Testing Materials. Hotel Statler.

Construction Totals Climb For 1956 and November In States East of Rockies

F. W. Dodge Corporation's construction figures resumed their long upward march in November after dipping slightly in October. At least eight new high records were set by the November total.

The Dodge figures are the dollar totals of Dodge Reports of contract awards for future construction in the 37 states east of the Rockies. The November grand total was $1,796,-787,000, up 20 percent above November of last year, and the highest November in Dodge's long history.

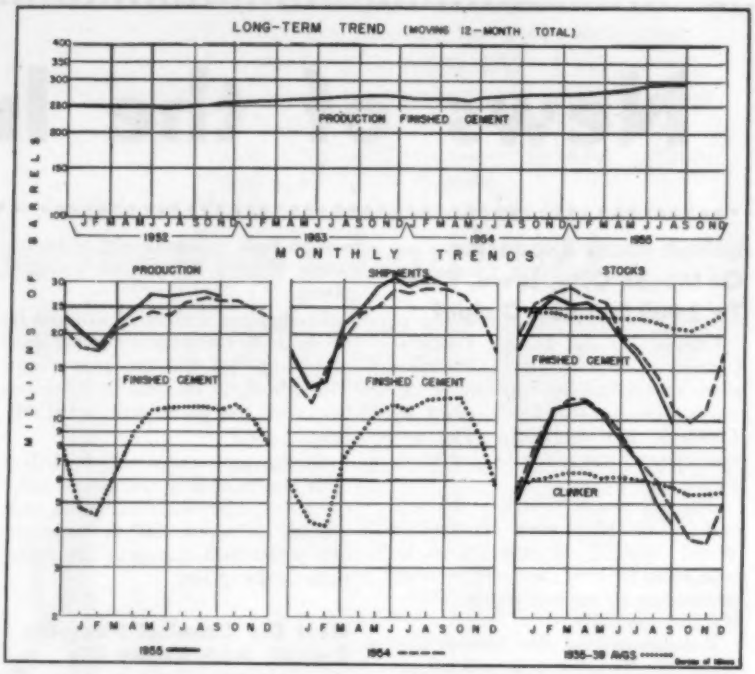
It became the 18th month out of the last 19 to show a gain over the corresponding month in 1954.

Dodge's residential classification showed a 2 percent gain after two months of decline, as compared with the corresponding months of last year. Prior to September this classification showed a gain for 20 successive months as against 1954.

New highs for November were set in all three of Dodge's basic classifications: non-residential, residential, and utilities and public works. New highs were set in those classifications for any January-to-November period. The 11-month grand total was a new high.

The details are as follows: The November non-residential total was $662,608,000, up 35 percent over November, 1954; residential, $725,-712,000, up 2 percent; utilities and public works, $408,467,000, up 37 percent.

For the 11-month period the following totals were established: non-residential, $7,770,004,000, up 21 percent; residential, $9,474,053,000, up 22 percent; utilities and public works, $4,580,466,000, up 21 percent; total construction, $21,824,-523,000, up 22 percent.


LONG-TERM TREND (MOVING 12-MONTH TOTAL)
PRODUCTION FINISHED CEMENT
MILLIONS OF BARRELS
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1952
1953
1954
1955
MONTHLY TRENDS
PRODUCTION
FINISHED CEMENT
SHIPMENTS
FINISHED CEMENT
STOCKS
FINISHED CEMENT
CLINKER
1955
1954
1935-39 AVG

SUMMARY—Production of finished portland cement in September, 1955, as reported to the U.S. Bureau of Mines, totaled 26,938,000 barrels—an increase of 6 percent over the September, 1954, figure. Mill shipments in September, 1955, totaled 29,523,000 barrels, an increase of 2 percent more than in September, 1954—while stocks of 9,802,000 barrels of finished portland cement on hand September 30, 1955, were 10 percent less than on the same date last year. Clinker production during the month totaled 25,892,000 barrels—an increase of 7 percent over the September, 1954, figure.

PRODUCTION—One hundred fifty-seven (157) plants in 37 states and Puerto Rico reported a production of 26,938,000 barrels of finished portland cement during September, 1955, as compared to 25,522,000 barrels during the same month last year.

Clinker production during the month of September was 25,892,000 barrels, compared to 24,132,000 barrels during September, 1954.

Clinker figures for 1955 are not strictly comparable with those of 1954 and earlier years because producers are now asked to report clinker in terms of the number of 376-lb. barrels of finished portland cement that could be produced from the quantity of clinker in question, whereas previously the unit of measure was the 376-lb. barrel.

Separate data on high-early-strength (Type III) by districts and prepared masonry cements appear in this year's reports. Production of high-early-strength portland cement in September, 1955, totaled 756,000 barrels, a decrease of 5 percent as compared to the September, 1954, production. The output of prepared masonry cement was 1,302,000 barrels of 376 lb., each.

SHIPMENTS—Mill shipments of finished portland cement were 2 percent higher in September, 1955, than in September, 1954, and totaled 29,523,000 barrels. This figure and the district totals that comprise it are not strictly comparable with mill shipments of previous years because they do not include, as in the past, the number of barrels of finished portland cement used in the manufacture of prepared masonry cements.

Shipments in September were higher in 12 districts and lower in 8. The greatest increases were registered in Oregon-Washington, southern California, Tennessee, and Colorado-Arizona-Wyoming-Montana-Utah-Idaho districts. The greatest decrease was in the Illinois district, followed by the Kansas district.

Mill shipments of high-early-strength portland cement in September, 1955, totaled 1,013,000 barrels. Half of these shipments were from mills in the eastern Pennsylvania-Maryland and Michigan districts. No shipments were made in the Puerto Rico district.

Mill shipments of prepared masonry cements in September, 1955, totaled 1,551,000 barrels. Two-thirds of the shipments were from mills in six districts—eastern Pennsylvania-Maryland, Indiana-Kentucky-Wisconsin, Michigan, New York-Maine, Virginia-Georgia-Florida-Louisiana-South Carolina-Mississippi, and western Pennsylvania-West Virginia. Prepared masonry cement data are given in equivalent barrels of 376 lb. each to maintain uniformity with the portland cement data.

STOCKS—Mill stocks of 9,802,000 barrels of finished portland cement were on hand September 30, 1955—10 percent less than the 10,909,000 barrels on hand September 30, 1954. Stocks of clinker on hand at the end of September, 1955, amounted to 4,308,000 barrels—a decrease of 9 percent from stocks on hand September 30, 1954.

Wis. Aglime Producers Assn. Names Helgesen President

At the annual meeting of the Wisconsin Aglime Producers Association, held at the Park Hotel in Madison on December 16 the following officers were elected: President, Lester A. Helgesen, Footville Lime and Rock Company, Footville, Wis.; vice-president, Michael Brisch, Rockwell Lime Company, Manitowoc, Wis.; and secretary-treasurer, Eddie P. Evenson, Einar Evenson and Sons, Cambridge, Wis.

Appearing on the program as speakers were the following: Dr. O. J. Attoe, chairman of the Department of Soils, College of Agriculture, University of Wisconsin; Professor C. J. Chapman, extension specialist (soils), College of Agriculture, University of Wisconsin; W. B. Griem, Feed and Fertilizer Section, State Department of Agriculture; Ingman O. Bolstad, fieldman, Wisconsin A.S.C. office; and Robert M. Koch, executive secretary, National Agricultural Limestone Institute.

"WE CAN PRODUCE the TOUGHEST of SPECIFICATIONS"

says Roy Horning, Vice President

Holly Sand & Gravel Co. Holly, Mich., near Flint, employs an Eagle Complete Washing-Classifying-Dehydrating Section at their modern plant. It consists of a 20′ Water Scalping-Classifying Tank with automatic power—operated bleeder valves, a 44″ dia. x 32′ Eagle Single Screw Fine Material Washer-Classifier-Dehydrator which processes concrete sand and a 20″ dia. x 18′ Double Screw Fine Material Unit which processes mason sand and an Eagle Double Log Washer which processes gravel.

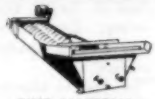
They are assured of clean material of the required gradations. Roy Horning, Holly's vice president states, "We can produce the toughest of specifications".

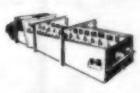
Eagle Aggregate Washing-Classifying-Dehydrating Equipment has no equal for economy and performance. Quickly returns its cost. The user benefits from Eagle's engineering "know how", greatest number of installations and a nationwide network of factory—trained distributors. Remember! Nothing takes the place of experience—and EAGLE has it!

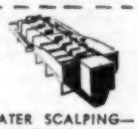
It's all in catalog 55 - Ask for your copy!

THE EAGLE LINE

COARSE MATERIAL WASHERS


FINE MATERIAL WASHERS


LOG WASHERS


WATER SCALPING—CLASSIFYING TANKS.

"SWINTEK" DREDGE LADDERS

CUTTER HEADS

COMPLETE DREDGES

BREAKER BALLS & PILE HAMMERS.

EXPERIENCE, PROGRESS, SERVICE, SINCE 1872

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N.S.G.A.-N.R.M.C.A. Convention Program

Conrad Hilton Hotel, Chicago, Ill., Feb. 13-16, 1956

FRIDAY, FEBRUARY 10

2:00—Annual meeting of Manufacturers Division of National Sand and Gravel Association

SATURDAY, FEBRUARY 11

10:00—Meeting of N.S.G.A. subcommittee of board of directors on proposal of the Hoover Commission to impose a toll charge on waterway users

2:30—Meeting of joint committee on safety

SUNDAY, FEBRUARY 12

10:30—Annual meeting of board of trustees of N.R.M.C.A.-N.S.G.A. Group Insurance Plan

2:30—Joint meeting of executive committees of N.S.G.A. and N.R.M.C.A.

2:30—Meetings of committees on nominations of N.S.G.A. and N.R.M.C.A.

MONDAY, FEBRUARY 13

9:30—Meeting of board of directors of N.S.G.A.

12:30—Joint luncheon of boards of directors of N.S.G.A. and N.R.M.C.A.

2:00—Meeting of board of directors of N.R.M.C.A.

9:30—Meeting of joint subcommittee on cost accounting.

2:00—Controller's conference.

2:00—Annual meeting of state and area association officials:

"Short Courses in Ready Mixed Concrete Under the Auspices of State and Area Associations"—
R. E. Hutchins, secretary, Mid-West Ready Mixed Concrete Association

"Co-operation with Allied Industries in Legislative Matters"—
Paul R. Smith, executive secretary, Empire State Sand, Gravel and Ready Mix Association.

"Services to Members"—
Claude L. Clark, secretary, Ohio Sand and Gravel Association and Ohio Ready Mixed Concrete Association

"Collective Bargaining with Labor Unions on Area Association Basis"—
E. R. Booker, executive secretary, Rock, Sand and Gravel Producers Association of Northern California Ready Mixed Concrete and Material Association

"Activities of State and Area Associations Producing Financial Savings for Members"—
H. J. Stockard, Jr., executive secretary, North Carolina Ready Mixed Concrete Association

6:00—Hospitality hour.

TUESDAY, FEBRUARY 14

9:30—Session 1—N.R.M.C.A.
Presidential address—
Louis C. Schilling, I. E. Schilling Co., Miami, Fla.

"Cement in 1956"—Charles Baker, president, Universal Atlas Cement Co., New York, N. Y.

"Cement for Ready Mixed Concrete in 1956"—Herbert G. Jahncke, Jahncke Service, Inc., New Orleans, La.

Report of the committee on nominations and election of officers.

Presentation of PIT AND QUARRY safety trophies.

9:30—Session 2—N.S.G.A.
Presidential address—John W. Murphy, Union Sand & Gravel Co., Spokane, Wash.

"Planning by Zoning Authorities for Development of Sand and Gravel Reserves"—Robert Mitchell, Consolidated Rock Products Co., Los Angeles, Calif.

"Good Community Relationships for the Sand and Gravel Industry"—E. K. Davison, J. K. Davison & Bro., Pittsburgh, Pa.

Report of the committee on nominations and election of officers.

Presentation of Rock Products safety trophies for 1954 and 1955.

12:30—Luncheon and style show for ladies of both associations at Marshall Field and Company.

2:00—Session 3—N.S.G.A. and N.R.M.C.A.
"Adequate Highways for the United States"—Ezra C. Knowlton, Utah Sand and Gravel Products Co., Salt Lake City, Utah

"The Tax Outlook for 1956"—John T. Sapienza, Counsel for two associations

"A Review of the Washington Scene"—Vincent P. Ahearn, executive secretary

2:00—Session 4—N.R.M.C.A.
Clinic on Calculating Proportions for Concrete and Methods of Testing and Sampling Concrete, conducted by D. L. Bloem, James F. Shook and Richard D. Gaynor

WEDNESDAY, FEBRUARY 15

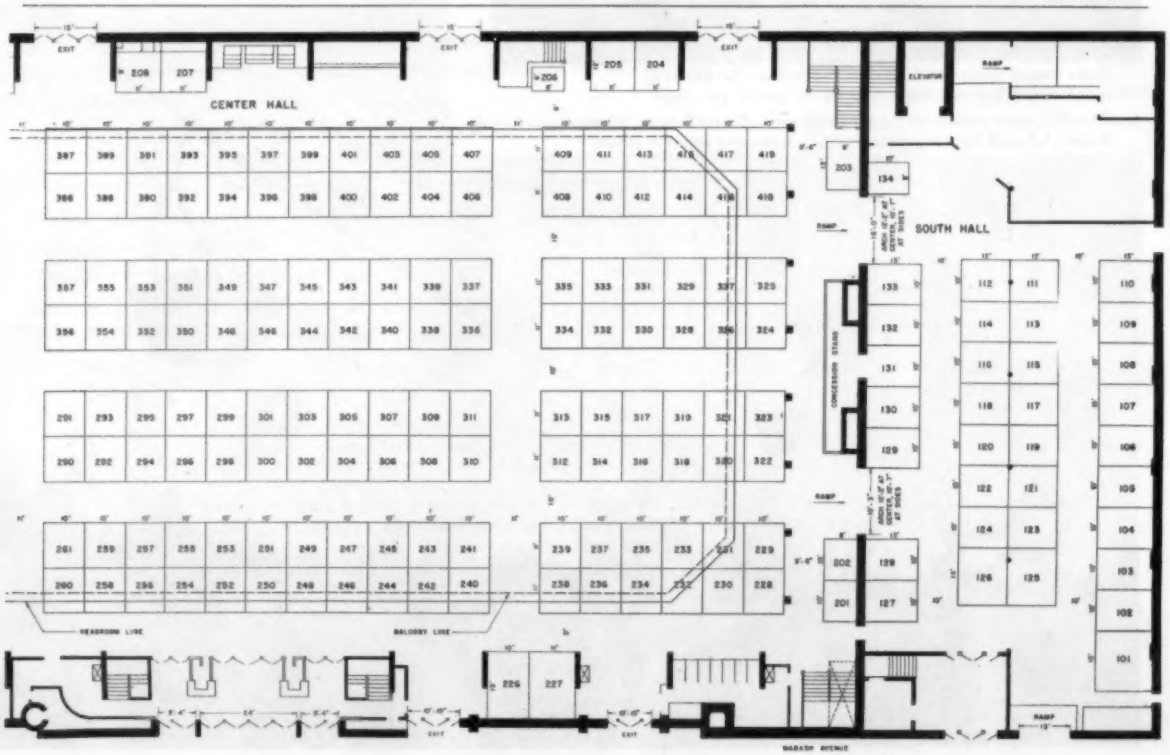
9:30—Session 5—N.R.M.C.A.
"Effect of Aggregates and Other Factors Affecting the Flexural Strength of Con-

List of Exhibitors—N.S.G.A. and N.R.M.C.A.

COMPANY	BOOTH
Dewey & Almy Chemical Co.	101-102
Nordberg Manufacturing Co.	103-104
Butler Bin Co.	105-106-107
C & W Sales Company, Inc.	108
National Conveyor & Supply Co.	109-110
Euclid Division, General Motors Corp.	111-113
S.K.F. Industries, Inc.	112-114
Autolene Lubricants Company	115-117
McLanahan & Stone Corp.	116-118
Stedman Foundry & Machine Co., Inc.	119-121
Hendrick Manufacturing Co.	120-122
W. R. Meadows, Inc.	123-125
Hardy Scales Co.	124-126
Stephens-Adamson Mfg. Co.	128-129
Sauerman Bros., Inc.	130-131
Union Wire Rope Corp.	132
Erie Strayer Co.	133
Scientific Concrete Service Corp.	134
Imperial Construction Co.	135
Instant Moisture Control, Div. Colorado Pre-Mix Concrete Co.	201
Concrete Publishing Corp.	202
Flexible Steel Lacing Co.	204-205
Sarasota Engineering Co., Inc.	206

Floor plan, N.S.G.A.-N.R.M.C.A. exhibit, Chicago Coliseum, Feb. 13-16.

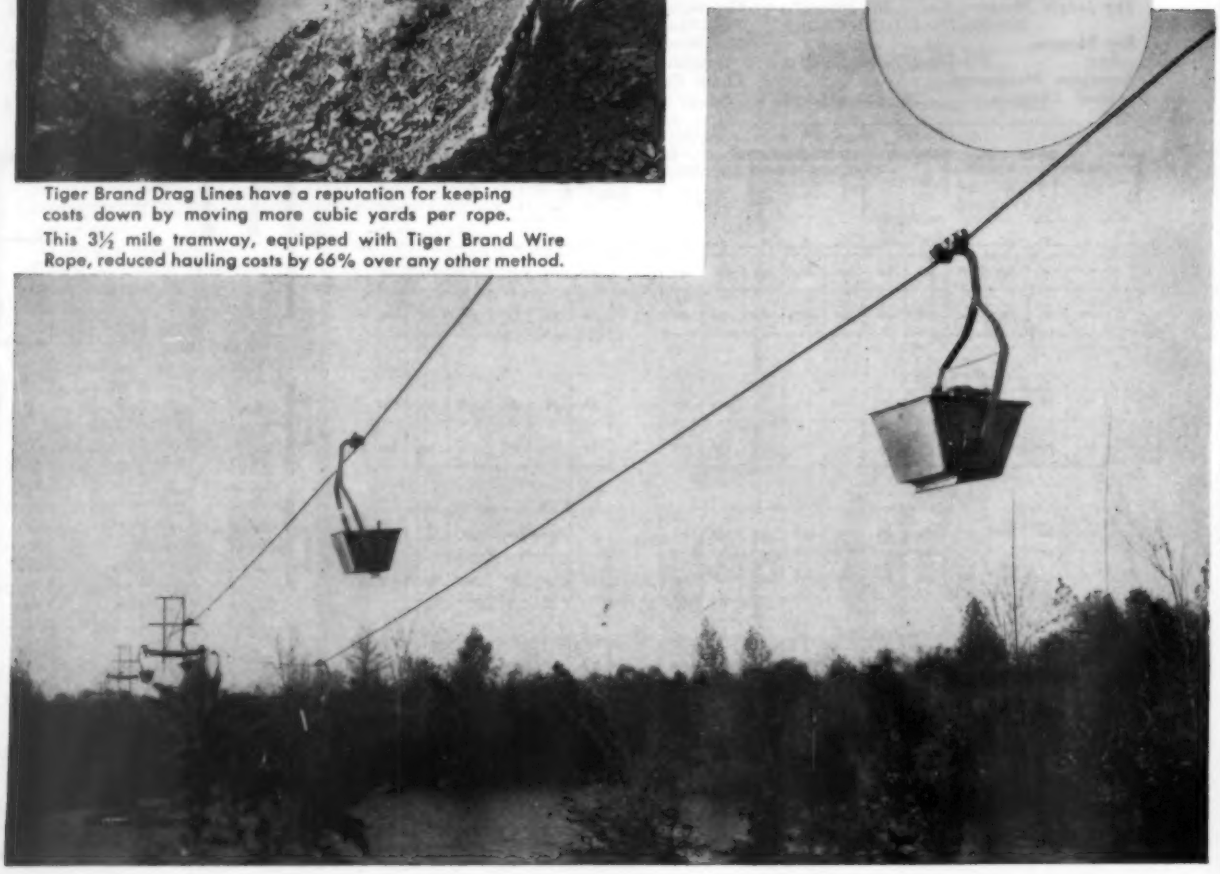
COMPANY	BOOTH
American Steel and Wire Div., United States Steel Corp.	207-208
Servicised Products Corp.	209
Chicago Fly Ash Company	210
Detroit Edison Company	210
Atlas Fly Ash, Inc.	210
G. & W. H. Corson, Inc.	210
Willard Concrete Machinery Co.	211-212
The W. S. Tyler Company	213-214
Ludlow Saylor Wire Cloth Co.	215
Crane Carrier Corp.	216
Rock Products	217
Charles E. Wood Co.	218
Kensington Steel Co.	219
Pioneer Engineering Works, Inc.	220-221
Hoyt Wire Cloth Co.	222
Burkhart Engineering Associates, Inc.	223
Smith Engineering Works	224-225
Radio Corporation of America, RCA Engineering Products Div.	226
Pit & Quarry Publications	227
Marion Power Shovel Co.	228-229
Meckum Engineering, Inc.	230
Concrete Transport Mixer Co.	231-232-233-234-235-236
The Frank C. Hough Co.	237-238-239-240-241-242
International Harvester Co.	243-244-245-246-247-248-249-250
Pettibone Mulliken Corp.	251-252-253-254-255-256-257-258
George Haiss Mfg. Co., Inc.	251-252-253-254-255-256-257-258
The Universal Engineering Corp.	251-252-253-254-255-256-257-258
The White Motor Co.	259-260-261-262-263-264
The Jaeger Machine Co.	265-266-267-268-269-270-271-272-273-274
Reo Motors, Inc.	275-276-277-278-279-280
American Manganese Steel Division	281-282-283-284
The Heltzel Steel Form & Iron Co.	285-286-287-288
Koehring Co.	289-290-291-292
The C. S. Johnson Co.	293-294-295-296
Cook Bros. Equipment Co.	297-298-299-300-301
Challenge Manufacturing Co.	302-303-304-305-306
Baldwin-Lima-Hamilton Corp.	307-308-309-310-311-312-313-314
Simplicity Engineering Co.	315-317-319-321
Hewitt-Robins Incorporated	316-318-320-322-324
The Master Builders Co.	323-325-327-329
Eagle Iron Works	326-328-330
L. Burmeister Co.	331-332-333
Link-Belt Co.	334-336-338-340-342
Westinghouse Transit Mixer Division, LeTourneau-Westinghouse Co.	335-337-339-341
Unit Crane & Shovel Co.	343-344-345-346-347-348
Caterpillar Tractor Co.	349-350-351-352-353-354-355-356-357-358
Mack Manufacturing Corp.	359-360-361-362-363-364
The T. L. Smith Co.	365-366-367-368-369-370-371-372-373-374
Littleford Bros., Inc.	375
The Thew Shovel Co.	377-379
Barber-Greene Co.	376-378-380
Northwest Engineering Co.	381-383-385
HarriSteel Products Co.	382
Symons Clamp & Manufacturing Co.	384
Link-Belt Speeder Corp.	386-388
W. O. & M. W. Talcott, Inc.	387
Monarch Road Machinery Co.	389
Richmond Screw Anchor Co., Inc.	390
Gruendler Crusher & Pulverizer Co.	391
Food Machinery and Chemical Corp.	392
Gar Wood Industries, Inc.	393-394-395-396
Chain Belt Co.	397-398-399-400-401-402-403-404-405-406
Clark Equipment Co.	407-408-409-410-411-412
Continental Motors Corp.	413-415
Deister Machine Co.	414-416
Construction Machinery Co.	417-418-419-420-421-422-423-424-425-426
Iowa Manufacturing Co.	427-429
Motorola Communications & Electronics, Inc.	428
The Solvay Process Division, Allied Chemical & Dye Corp.	430
Hercules Motors Corp.	501-502-503-504
Noble Company	505-506
General Electric Company	507
Dodge Division, Chrysler Corp.	508
Quaker Rubber Corp., Div. H. K. Porter Co., Inc., of Pittsburgh	509
The Jeffrey Manufacturing Co.	510-511
Whiteman Manufacturing Co.	512-513-514
Morris Machine Works	515-516
Cleaver-Brooks Co.	517-518-519
Sika Chemical Corp.	520
Western Machinery Co.	521-522
Calcium Chloride Institute	523
Contractors and Engineers Monthly	524
Pick Manufacturing Co.	525
Diamond Iron Works, Div. Goodman Mfg. Co.	526
Blaw-Knox Co.	527-528-529-530-531-532-533-534-535-536
Oshkosh Motor Truck, Inc.	537-538-539-540-541-542
The Travel Batcher	543-545-547
Murphy Diesel Co.	544-546-548
Screen Equipment Co., Inc.	549-550
Worthington Corp.	551-552-553-554-555-556-557-558-559-560
Allis-Chalmers Mfg. Co.	561-562-563-564-565-566-567-568-569-570
Taylor-Wharton Iron & Steel Co., Div. Harrisburg Steel Corp.	571-572



WHETHER YOU SHOVEL IT...

DRAG IT...

OR HAUL IT



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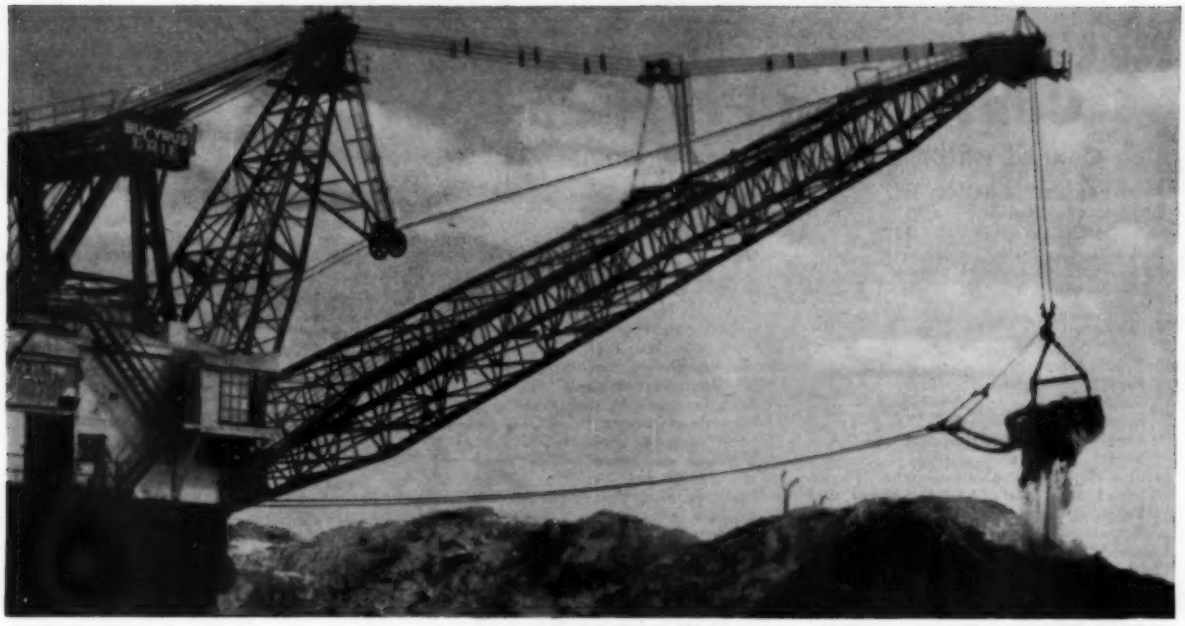
This 3½ mile tramway, equipped with Tiger Brand Wire Rope, reduced hauling costs by 66% over any other method.



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BY AIR... Tiger Brand delivers top yardage per dollar spent for wire rope

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Excellay Preformed

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UNITED STATES STEEL

Nat'l Crushed Stone Assn. Convention Program

Conrad Hilton Hotel, Chicago, Ill., Feb. 19-22

SUNDAY, FEBRUARY 19

9:00-5:30—Registration

MONDAY, FEBRUARY 20

8:30-5:30—Registration

9:15—Appropriate motion picture

10:00—Greetings from the President T. C. Cooke

10:10—Report of elections by board of directors

10:15—Staff reports

Report of engineering director—A. T. Goldbeck

Report of field engineer—J. E. Gray

Report of administrative director—J. R. Boyd

11:30—"Highway Legislation—What Happened and What's Ahead"—Arthur C. Butler, director, National Highway Users Conference, Washington, D.C.

12:00—Adjournment

12:30—Greeting Luncheon

Presentation of N.C.S.A. Safety Contest—H. H. Kirwin, chairman, N.C.S.A. Accident Prevention Committee, treasurer, Eastern Rock Products, Inc., Utica, N.Y.

"Let's Get Personal"—George A. Bowie, businessman, author, Michigan City, Ind.

Afternoon Session

2:30-6:00—Inspection of Manufacturers' Division Exposition, Exposition Hall

Evening

6:30—Cocktails—Dinner—Dancing (Informal)

TUESDAY, FEBRUARY 21

8:00-5:30—Registration

Morning Session

Operating Men and Equipment Manufacturers

8:15—Appropriate motion picture

8:30—Operating problems

Rock breakage by explosives

New developments in drilling and related explosive problems

Methods and operation of surge pile storage

Methods of centralizing electrical controls for labor saving

How we avoid overloading and spillage in highway haulage

12:00—Adjournment

12:30—Manufacturers Division Luncheon and annual business meeting (for members of the Manufacturers Division only)

Afternoon Session

2:30—Committee reports

3:00—"New Developments in Concrete"—G. D. Kennedy, president, Portland Cement Association, Chicago, Ill.

3:30—"Significant Developments Regarding Insurance Subrogation Problems"—Warren C. Rowe, chairman, N.C.S.A. Subrogation Committee, treasurer, Rowe Contracting Co., Malden, Mass.

4:00—Discussion

4:30—Adjournment

Evening

Open for individual plans and such group meetings as may be desired

WEDNESDAY, FEBRUARY 22

8:30-5:30—Registration

9:00-12:00—Inspection of Manufacturers Division Exposition, Exposition Hall

12:30—General Luncheon

"Report on Europe"—Eddy Gilmore, Associated Press foreign correspondent, former chief (11 years) of AP's Moscow Bureau

Afternoon Session

3:00—"Designing Flexible Pavements for Strength—Not Thickness"—R. C. Herner, Bureau of Yards and Docks, U. S. Navy, Indianapolis, Ind.

3:30—"Most Recent Developments in the Field of Percentage Depletion"—John F. Lane, Gall, Lane and Howe, Washington, D.C., general counsel, N.C.S.A.

4:00—Discussion

4:30—Adjournment

Evening

6:00—Reception

7:00—Banquet

"Two Plus Two Aren't Always Four"—Tom Collins, humorist, philosoher

Program Of 39th Annual Convention Of National Agricultural Limestone Institute

Sheraton-Blackstone Hotel, Chicago, Ill., Feb. 15-17

WEDNESDAY, FEBRUARY 15

MORNING SESSION

CRYSTAL BALLROOM

Presiding—President John H. Riddle

Registration—Foyer of Crystal Ballroom

9:00 a.m.—Movie—"The Other Side of the Fence"—By W. A. Albrecht for Phillips Petroleum Co.

9:30 a.m.—Call to order and welcome by president

Reading of minutes of previous meeting

Treasurer's report—Alvin R. Armbrust

Committee reports by chairmen:

By-Laws—Joseph J. Griesemer

Convention Arrangements—Russell W. Hunt

Finance & Budget—J. B. Mount

Legislative and Public Relations—William J. Clark

Membership—Buford V. Everett

Percentage Depletion—Charles Rich

Promotion and Education—William F. Childs, III

Resolutions—R. B. McNab

State Associations—Paul E. Thompson

Region I—Thomas B. Stafford

Region II—Earl P. Holwadel

Region III—A. E. Richardson

Region IV—A. E. Markgraf

Region V—Herbert C. Gray

Executive secretary's report

Old business

New business

GREETING LUNCHEON—12:30 p.m.

MAYFAIR ROOM

Presiding—Regional Vice-President L. R. Falk

"A Quick Review and a Look Ahead"—By Robert M. Koch, executive secretary, N.A.L.I.

AFTERNOON SESSION—2:30 p.m.

CRYSTAL BALLROOM

Panel on Promotion—R. B. McNab, William E. Hewitt, W. Dean Fyock, and William E. Stone

MANUFACTURERS' DIVISION

IVY ROOM—2:30 p.m.

EVENING PROGRAM

6:00 p.m.—Cocktails—Hubbard Room

7:00 p.m.—Buffet Supper—Crystal Ballroom

8:30 p.m.—Dancing—Crystal Ballroom

THURSDAY, FEBRUARY 16

THE BIENNIAL SHOW—COLISEUM

This day has been set aside so that members and guests may visit the Biennial Show at the Coliseum. This show is in conjunction with the 40th Annual Convention of the National Sand and Gravel Association and the 26th Annual Convention of the National Ready Mixed Concrete Association.

FRIDAY, FEBRUARY 17

MORNING SESSION—HUBBARD ROOM

9:00 a.m.—Movie. This will be an operation film which Chairman Black believes will stimulate discussion from the floor during this morning session.

9:30 a.m.—Panel on Operations—William S. Black, C. A. Broecker, and W. D. Dillon

LUNCHEON—12:30 p.m.

MAYFAIR ROOM

Presiding—Russell W. Hunt

"Conservation—A National Need," by Ervin L. Peterson, Assistant Secretary of Agriculture

AFTERNOON SESSION—2:30 p.m.

HUBBARD ROOM

Panel on the Agricultural Conservation Program

Presiding chairman—Robert M. Koch, executive secretary, N.A.L.I.

Panel Participants—Lester E. Leigh, Harris W. Soule, Hubert E. Dyke, Paul M. Koger, and James R. Lyons, all of the United States Department of Agriculture (area directors of Commodity Stabilization Service)

EVENING SESSION

HUBBARD ROOM

6:00 p.m.—Reception

CRYSTAL BALLROOM

7:00 p.m.—Annual banquet

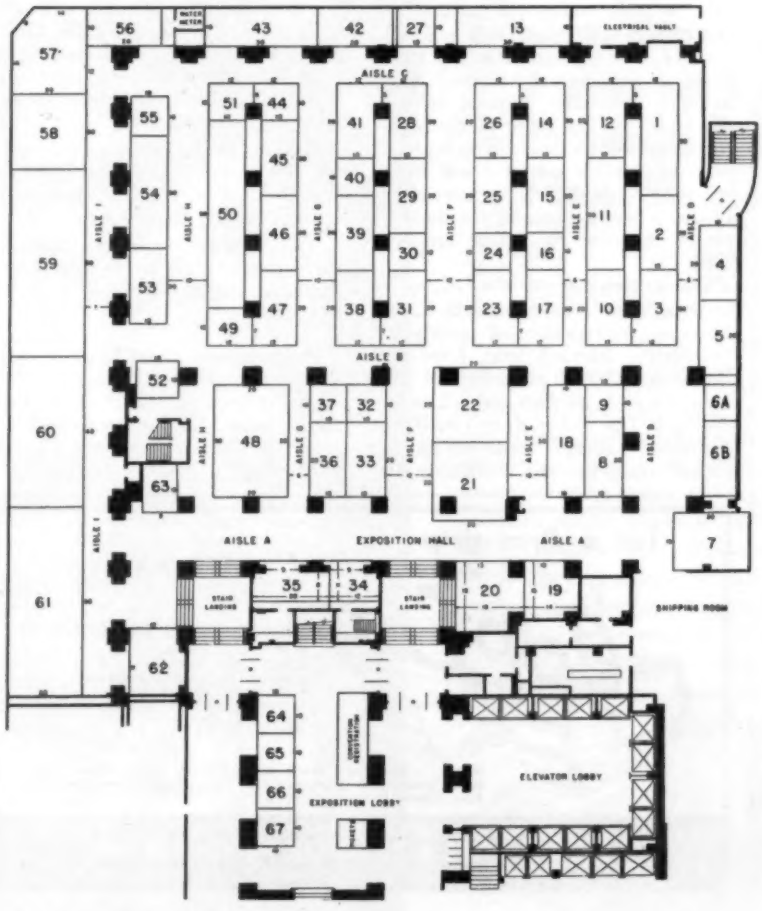
Presiding—President John H. Riddle

"From Abundance to Bondage," by Ralph G. Brooks

List of Exhibitors — N.C.S.A.

COMPANY	BOOTH
Allis-Chalmers Mfg. Co.	59
American Cyanamid Co.	39
American Manganese Steel Division American Brake Shoe Co.	21
American Steel & Wire Division United States Steel Corp.	26
Aquadyne Corporation	19
Atlas Powder Co.	45
Baldwin-Lima-Hamilton Corp. Construction Equipment Division	38
Barber-Greene Co.	3
Boston Woven Hose & Rubber Co.	66
Brunner & Lay Rock Bit of Asheville, Inc.	67
Bucyrus-Erie Co.	58
Buda Division Allis-Chalmers Mfg. Co.	59
Cape Ann Anchor & Forge Co.	65
Caterpillar Tractor Co.	60
Contractors and Engineers	9
Deister Machine Co.	17
Diamond Iron Works Division Goodman Mfg. Co.	24
Du Pont, E. I., de Nemours & Co.	13
Dustex Corp.	55
Eagle Iron Works	11
Easton Car & Construction Co.	47
Euclid Division General Motors Corp.	14
Grog, Switch & Mfg. Co.	6A
General Electric Co.	32
Haiss, George, Mfg. Co., Inc. Division of Pettibone Mulliken Corp.	61
Harnischfeger Corp.	48
HarriSteel Products Co.	44
Hendrick Mfg. Co.	8
Hercules Powder Co.	36
Hetherington & Berner Inc.	16
Hewitt-Robins, Inc.	50
Hoyt Wire Cloth Co.	27
Ingersoll-Rand Co.	1
Iowa Manufacturing Co.	46
Jaeger Machine Co.	43
Jeffrey Manufacturing Co.	29
Johnson-March Corp.	40
Joy Manufacturing Co.	53
Kennedy-Van Saun Mfg. & Eng. Corp.	51
Kensington Steel Co.	56
Koehring Co.	22
Link-Belt Speeder Corp.	41
Ludlow-Saylor Wire Cloth Co.	30
Marion Power Shovel Co.	7
McLanahan & Stone Corp.	23
Murphy Diesel Co.	54
Nordberg Mfg. Co.	15
Northern Blower Co.	52
Northwest Engineering Co.	18
Pettibone Mulliken Corp.	61
Pioneer Engineering Works, Inc.	57
Pit & Quarry Publications, Inc.	49
Radio Corporation of America	6B
Rock Products	34
Screen Equipment Co., Inc.	4
Simplicity Engineering Co.	37
SKF Industries, Inc.	12
Smith Engineering Works	31
Stedman Foundry & Machine Co., Inc.	20
Stephens-Adamson Mfg. Co.	25
Taylor-Wharton Iron & Steel Co.	10
Thew Shovel Co.	28
Thor Power Tool Co.	42
Torrington Co. Bantam Bearings Division	2
Traylor Engineering & Mfg. Co.	5
Tyler, W. S., Co.	33
Universal Engineering Corp.	61
Vibration Measurement Engineers	62
Wickwire Spencer Steel Division Colorado Fuel and Iron Corp.	63
Williams Patent Crusher & Pulverizer Co.	35

Floor plan, N.C.S.A. Manufacturers Division exhibit, Conrad Hilton Hotel, Feb. 20-22.



Power Crane & Shovel Assn. Names Officers, Directors

The Power Crane and Shovel Association at its annual meeting in December elected the following officers and directors: president, D. W. Lehti, president of Link-Belt Speeder Corporation, Cedar Rapids, Iowa; and vice-president, M. B. Garber, vice-president of The Thew Shovel Company, Lorain, Ohio.

Directors named are P. H. Birckhead, vice-president of Bucyrus-Erie Company, South Milwaukee, Wis.; and C. B. Smythe, president-treasurer of The Thew Shovel Company (three years).

Herbert S. Blake Jr. is executive secretary of the association, which maintains headquarters in New York City. Members are 13 major manufacturers of power crane and shovel equipment.

Cement Making Equipment Shipped to Spanish Concern

Among the last of quantities of equipment supplied Cia. General de Asfaltos y Portland (Asland) of Barcelona, Spain, by Allis-Chalmers Manufacturing Company, was a 3,000-kw. WA-Series steam turbine-generator unit.

Rotary cement kilns, grinding mills and other processing machinery, pumps, motors, controls, condensers, "Texrope" V-belt drives, and auxiliary equipment have been furnished in recent months by Allis-Chalmers for this large Spanish cement producer's plants in Villaluenga, Moncada, and Cordoba.

Construction is scheduled to begin within 60 days on a new cement plant near Manizales, Colombia, to be called Sociedad Cementos de Caldas. About 50 percent of its cost, 5,000,000 pesos ($2,000,000) is reported to have been loaned by the National Federation of Coffee Growers of Colombia.

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UNUSED Army Trucks
2½, 3½, 5-ton
GMC-DIAMOND T & INTERNATIONAL 6x6's

- From Government Storage!
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Tandem axle trucks with front wheel drive, 10 forward speeds, overdrive, brand-new mud and snow tires. Carry maximum loads, give extra power you need in "rough going" . . . at LESS, often half the COST of conventional new trucks.

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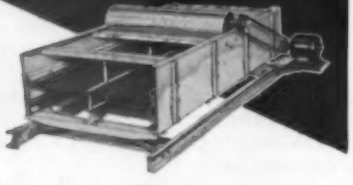

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A. H. Brooks Named President Of Missouri Limestone Producers

Arly H. Brooks, owner of a limestone plant at Kahoka, Mo., was recently elected president of the Missouri Limestone Producers Association for 1956. Other officers elected at the 11th annual meeting of the association at Jefferson City were O. L. Taetz, Grary Summit, vice-president (re-elected); and Roy E. Mayes, president of Carthage Marble Corporation, Carthage, secretary-treasurer (re-elected).

About 250 persons registered for the meeting, association's largest to date. Those attending included producers, associates, and friends. It was conceded that the general outlook for 1956 lime business is much brighter. It was pointed out by Robert M. Koch, executive secretary of National Agricultural Limestone Institute, Washington, D.C., that the soil bank, though not a panacea for all ills of the industry will help to get agricultural limestone onto the farms of the nation. He pointed out that a peak tonage of aglime of about 32,000,000 tons was reached in 1947. It is expected that the 1955 tonnage will be about half that amount, nationally. Experts believe this to be the low point of the present decade. Anticipated farm income and the possible use of a soil bank in the Agricultural Conservation Program are the reasons for the expected increase in aglime use in 1956.

Other speakers at the Missouri meeting were: Roberto de la Rosa, Mexican ambasador of goodwill, Monterrey, Mexico, and John H. Hendren. Mr. Rosa delighted his audience with wisdom and wit as he discussed *The Other American Way.* Americans always seem to be in such a rush, he said, "catching an airplane, grabbing a bite, running over to see someone." He admonished his audience to slow down and live better and longer.

Mr. Hendren, a member of the legal firm Hendren and Andrae, Jefferson City, M.L.P.A. counsel since the association was incorporated in 1947, spoke on legal matters facing the ilmestone industry. Principal items cited were: preclusion of county courts from selling crushed stone products to the public, transportation taxes, public service truck permits, percentage depletion, and pending legislation.

Those elected idrectors are Arly H. Brooks, Kahoka; Roy E. Mayes, Carthage; and Earl Thomas, Sedalia. Terms of these directors expires in 1956.

Those whose terms expire in 1957 are Ben Lustig, Independence; H. E. McClain, Wellsville; and O. L. Taetz, Gray Summit.

Elected to serve through 1958 are L. H. Bray, Bray Construction Company, Rolla; R. W. Holub, Concrete Materials & oCnstruction Company; and Frank Snyder, Snyder Quarries, Gallatin.

Paul N. Doll was named manager for 1956; and the firm of Hendren and Andrae was again appointed counsel for the coming year.

The members expressed apreciation to the retiring officers for a very successful tenure of service.

A change of name has been announced by the management of Dewitt Aggregates, Inc., Onandaga, N. Y., which in the future will be known as Dewitt Sand and Gravel, Inc.

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TRACTOR GROUSER RETREAD
- EXCLUSIVE DESIGN
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Also . . . Steel Plate, Grader Blades, Special Cutting Edges, Pneumatic Tools, Traffic Signs and Sign Posts, Gutter Broom Wire and Fibre Brooms.

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the drum nobody beats

Calaveras Cement Co. reports:

- **4 tough years and still in service**
- **no wear to date**
- **3 times life of drums formerly used**

That's the "Tool Steel Process" record at Calaveras Cement Co., San Andreas, Calif., where TSP products are widely used, and that's why in cement plants all over the nation a TSP drum is a drum nobody can beat.

here's why: Ordinary drums have soft groove surfaces. They develop wear, corrugating, and chafing, resulting in frequent costly cable and drum replacements. TSP drums are file hard with smooth, true wear-resistant grooves. They stay that way for years. Any side swinging of loads has no effect on TSP drum grooves. All chafing of cables is eliminated. Savings in cables alone will pay for the drums, because, to date, no TSP drum has ever worn out.

Write today for your copy of Bulletin 452, illustrating the many TSP products available for the cement industry... each carrying an absolutely positive written GUARANTEE to give a longer life in the same service than any other product.

Calaveras Cement has achieved tremendous savings using such TSP products as Sheave Wheels, Track Wheels, Trunnion Rollers, Gears, Pinions, Sprockets, as well as Crane Drums.

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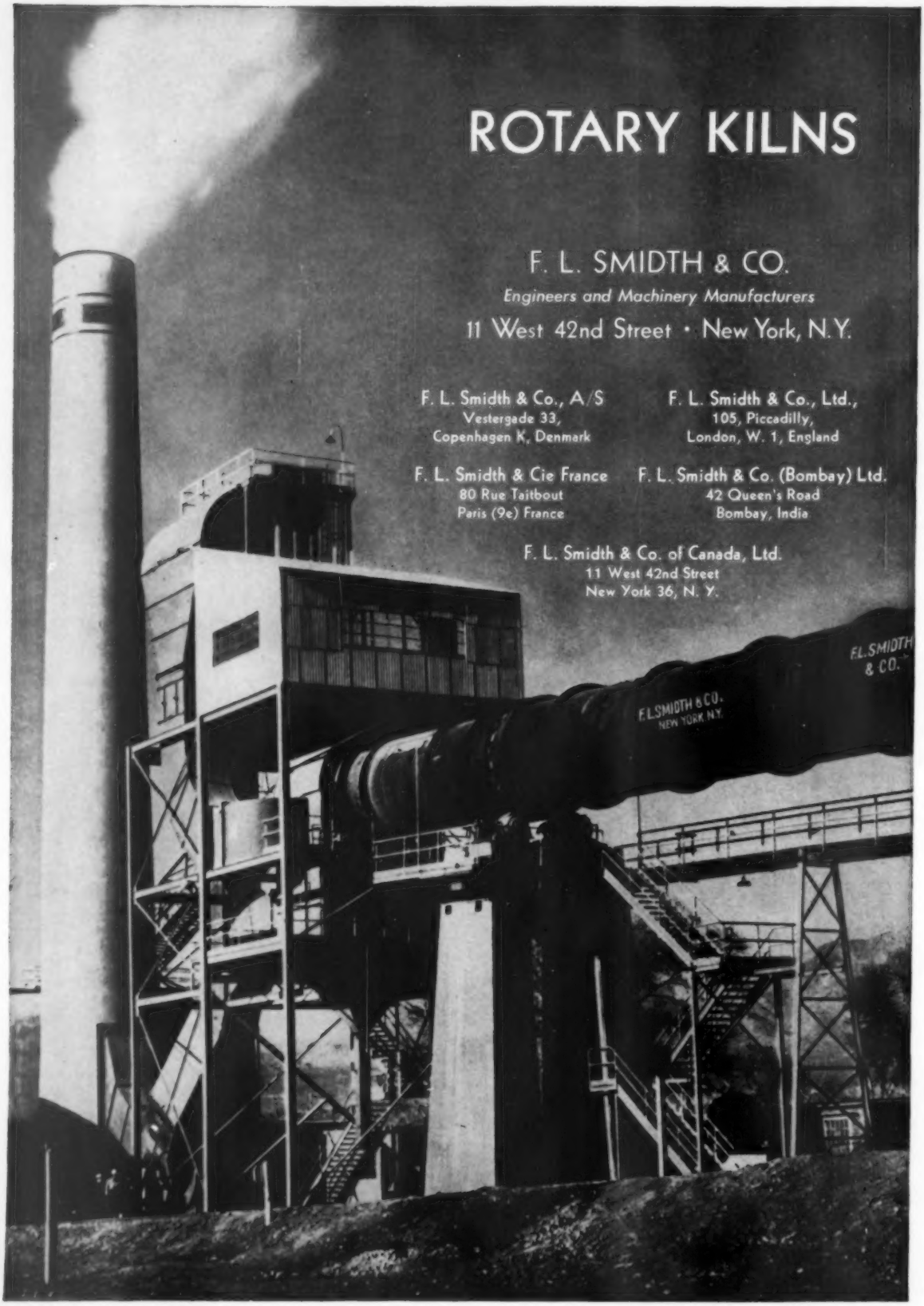
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$10,000,000 Cement Plant Planned Near Kingston, N.Y. By Newly-Formed Concern

Plans for a $10,000,000 cement plant near Kingston, N. Y., were recently announced. It was indicated that the Strelene Realty Corporation had obtained options on 150 acres in downtown Kingston, with a 1,000-ft. frontage on the Hudson River.

Initial capacity of the plant is expected to be 6,000 bbl. daily, but a capacity of 9,000 bbl. per day is expected to be reached within one year. A spokesman for the newly-formed concern stated that the Strelene Corporation is an independent company. Names of backers were withheld.

Construction will begin as soon as zoning changes are made by the Kingston Common Council. Some parcels are classified as residential, although the major portion of the site is zoned for industrial use.

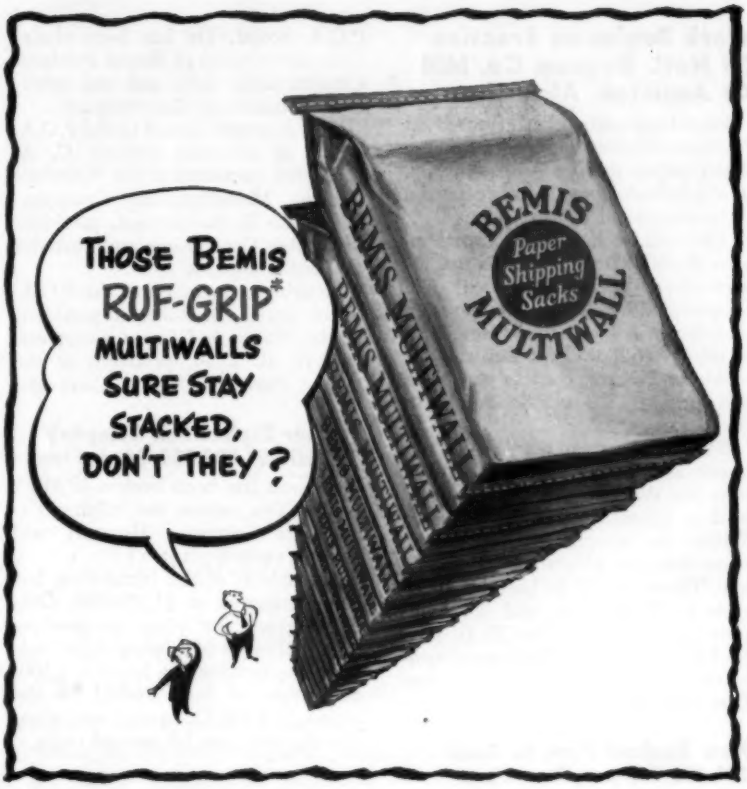
Doll Named to State Office Of Rotary International

Paul N. Doll, manager of the Missouri Limestone Producers Association, Jefferson City, Mo., was recently

Paul N. Doll

named a district governor of Rotary International, world-wide service organization, for the 1955-56 fiscal year. In his new post Mr. Doll will co-ordinate the activities of 29 Rotary Clubs in one of five districts in Missouri.

In addition to his duties as manager of the state limestone producers association, Mr. Doll is executive secretary of the Missouri Society of Professional Engineers.



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Sales Offices in Principal Cities

Work Begins on Erection Of Natl. Gypsum Co. Mill At Anniston, Ala., Site

Foundations have been poured on National Gypsum's new multimillion dollar paper mill in Anniston, Ala. The totally-enclosed mill is expected to be completed by next July.

The mill itself will encompass an area of 155,000 sq. ft. within the 45-acre site, of which 7,000 sq. ft. will be occupied by offices. The one-story structure will be of steel frame with simple exterior walls of Dri-wall tile masonry. Precast concrete roof slabs will support a 20-year bonded built-up roof.

The new paper mill will use waste paper and have an output of 200 tons per day, all of which is to be used as gypsum wallboard covering. Within the structure there will be seven concrete chests for stock storage. Three are 32 ft. long by 19 ft. wide by 13 ft. deep and the other four are 11 ft. wide by 25 ft. long by 8 ft. 4 in. deep. The general contractor is the Daniel Construction Company of Alabama.

New Zealand Firm to Back 100,000-Ton-per-Year Plant

Westport, New Zealand, is the site chosen for the location of a cement plant backed by the Tunnel Portland Cement Company and William Baird and Company, William Cory and Son, and the Northern Mercantile and Investment Corporation.

Construction is to begin "at the earliest possible date" on the £2,000,000 (approximately $5,600,000) facilities. Annual capacity of the plant is to be 100,000 tons. The firm organized to operate the installation is to be known as the New Zealand Cement Company.

Equipment and machinery is to be supplied by F. L. Smidth and Company, which will also furnish consulting engineers for the construction of the plant.

It was indicated that the New Zealand Government welcomes the project, since cement production there cannot meet the steadily increasing demand. Imports of cement this year will probably reach 175,000 tons.

Ford Re-elected Chairman Of P.C.A. Board of Directors

Emory M. Ford, chairman of the Huron Portland Cement Company, was recently re-elected chairman of the Portland Cement Association. Mr. Ford was made chairman last year after 11 years of service on the P.C.A. board. He has been chairman of the board of Huron Portland Cement since 1953, and was previously president of that company.

New directors elected to the P.C.A. board of directors include C. S. Crawford, president of the Whitehall Cement Manufacturing Company, and Allan B. Sunderland, president of the Ash Grove Lime and Portland Cement Company.

Retiring as members of the P.C.A. board are H. B. Robeson, president of the Nazareth Cement Company, and W. E. Tyler, president of the Dewey Portland Cement Company.

Sulphur Exploration Company To Build $1,500,000 Texas Plant

Ground has been broken in High Island, Tex., where the Sulphur Exploration Company, Houston, will construct a new plant.

Initial cost of the installation has been estimated at $1,500,000. Officials expect the plant to produce about 300 tons of sulphur daily. Sulphur Exploration has leased a 1,500-acre tract of land owned by the Standolind Oil Company, and plans to mine the area for several years.

According to Cementa, Sweden's leading cement sales company, that country's consumption of cement has increased by 6 to 7 percent annually during the last two decades. Capacity of Sweden's cement industry has risen from 1,100,000 tons in 1939 to 2,500,000 tons in 1955, including about 300,000 tons for export.

Put-in-Place Construction Shows Seasonal Slump But November Sets Record

The value of new construction put in place declined seasonally in November, but the $3,600,000,000 expended set a new record for the month and was 7 percent above November, 1954, according to preliminary estimates prepared jointly by the U. S. Departments of Commerce and Labor. On a seasonally adjusted basis, outlays for new construction were at an annual rate of $41,600,000,000.

During the first 11 months of 1955 new construction expenditures amounted to $38,900,000,000, topping last year's 12-month total of $37,600,000,000 and virtually assuring a new annual record of $42,000,000,000 for 1955.

Private construction expenditures decreased 5 percent in November as residential building continued to reflect the recent decline in housing starts. Both private industrial building and office building, on the other hand, rose to new monthly records.

All major types of construction contributed to the 16 percent decrease from October to November in public outlays. In most instances, however, the rate of decline was more moderate than the usual downturn at this time of year.

The main offices of the Warner Company, Philadelphia, Pa., were moved recently to a new location. The new address is 1721 Arch Street, Philadelphia 3, Pa.

Chicago TV Show Gives Story Of Sensibar Filling Method

Midwesterners got a dramatic explanation of the process used to fill in the Chicago lakefront when the television show *This is the Midwest* on WBBM-TV presented the story of J. R. Sensibar, president of Construction Aggregates Corporation, Chicago, Ill.

When Mr. Sensibar's company got the job of filling in the Chicago lakefront, his concern was only a few years old. In order to accomplish the huge task, he devised the hydraulic method of piping sand to the required areas to make the whole project economically feasible. The Sensibar method of filling and dredging is now being used around the world.

J. R. Sensibar (standing) uses a map to explain his land-fill work on the Chicago lakefront. At Mr. Sensibar's side (seated) is his son, George Sensibar, public relations director of Construction Aggregates Corp. Interested listeners are Les Weinrott, WBBM-TV executive producer, (center), and Fahey Flynn host of the show.

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Our 40th Anniversary

As we complete four decades of service to the producers of sand, gravel, crushed stone, cement, lime, gypsum and other nonmetallic minerals, we look confidently ahead into the future.

What the next 40 years will bring to our Industry no one can envision. But Pit and Quarry will be there to report, interpret and prognosticate—growing with the Industry and with America.

In the months ahead, we will celebrate our 40th Anniversary with the resolve to surpass our achievements of the past—to give to this vast Industry an even greater measure of devotion and service.

Pit and Quarry Publications, Inc.

Moderate cost . . . light on labor little maintenance . . . BUT

Crescent Scraper of 5-cu. yd. capacity—rigged for gravity return—shown returning to excavation point in the pit. Ask for Catalog A.

SAUERMAN EQUIPMENT

Check on digging power . . . rate of haul . . . clean dumping. Add labor economy . . . low upkeep . . . personnel safety . . . moderate power consumption. Total up the score . . . you'll choose one of these Sauerman Machines for your operation.

DRAG SCRAPER: best for pit or hill excavation, reclamation or general handling of materials, wet or dry. Serves as rapid, long range conveyor. Sizes ⅛ to 18 cu. yds.

SLACKLINE CABLEWAY: best for deep digging — especially underwater — and conveying to a high delivery point. Reaches down a hundred feet or more . . . spans up to 1000 ft. . . . sizes ⅛ to 3½ cu. yds.

DRAG SCRAPER STOCKPILER: best for profitable handling of sand and gravel, ores and chemicals. Low on first cost, plus economical one-man operation.

CRESCENT SCRAPER ON BOOM MACHINE: best for increasing the work capacity of any boom machine on backfilling and grading jobs. When scraper is used with track cable and trolley machine, range is greatly extended.

Call on Sauerman's **experienced** engineers for the size and type system best suited to your digging, hauling or materials handling requirements. Write for catalog . . . ask for idea-packed Sauerman News.

Slackline cableway performs difficult excavation of non-caving material from deep pit. 70% rock and 30% colloidal sand posed tough digging job. Ask for Catalog C and Field Report 216.

Two small scrapers reclaim different sizes of crushed stone from adjoining piles to belt conveyors delivering to a common hopper used to load cars with straight or mixed sizes. Ask for Catalog E.

Crescent on boom machine dumps large load of wet peat. Bucket is gravity-returned on track cable to digging point. Ask for Catalog J-1 and Field Report 226

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Staff Changes Announced By Wedron Silica Co.— A. Warsaw to Retire

It has been announced that A. Warsaw, president of the Wedron Silica Company, Chicago, Ill., from 1911 to 1954, is retiring from active service with the firm. From December 31, 1954, until his retirement he was chairman of the board.

Under the leadership of Mr. Warsaw the Wedron Silica Company grew from a small operation to a position of prominence in the industrial sand industry. He and Mrs. Warsaw plan to move to California.

Other changes in the staff of Wedron are as follows: Fred Hanna has been named superintendent of the plant; John A. Dummett, plant superintendent since 1920, is retiring; and Marshall W. Kidd has been appointed assistant superintendent.

Mr. Hanna has been with the firm since 1933 and has been serving for many years in the post which he is now relinquishing. Mr. Kidd has also been with Wedron for several years in a supervisory capacity.

American-Marietta Plans To Buy Southern Cement

American-Marietta Company has announced a multimillion-dollar plan for the purchase of the Southern Cement Company, Birmingham, Ala., one of the South's major producers of cement and chemical lime.

While the purchase price was not announced, the transaction will be in the millions. Transfer of American-Marietta common stock to Southern Cement stockholders has been arranged.

Established in Birmingham in 1901, Southern Cement is headed by W. J. Cabaniss, president, who holds a controlling interest in the firm's two cement plants, one in North Birmingham and the other in adjoining Shelby County, Ala.

Producers of a widely-diversified line, American-Marietta and its subsidiaries manufacture paints, protective coatings, adhesives, resins, and cement admixtures used to improve the durability of concrete and precast pipe. The firm entered the cement manufacturing business a year ago when it acquired controlling stock in the Standard Lime and Cement Company, of Baltimore.

Oregon has another county rock-processing operation since the opening of the $62,000 crushing plant of Umatilla County recently. Capacity of this plant is approximately 600 cu. yd. per day.

Cut down man hours! Speed up hole drilling!

2 new more powerful Thor wagon drills!

THOR SW-1

Compact size—3 wheel reinforced rig • Weight with model 75 drifter—768 lbs. • 2 handle controls movable along mast • Handles up to 3½" bore drifter • New centralizer swings out of way for close drilling • Mast swings 360° vertical or horizontal • Wet or dry operation

General purpose SW-1 • Heavy duty BW-2

Now Thor offers two new wagon drills to fit every drilling requirement — wagon drills which will outperform and out-last other models. Drill holes in any direction, at any angle, on level or sloped ground. One man operation cuts costly man hours. Check these features on the new heavy duty BW-2 and the general purpose SW-1 and then call your Thor contractors tool distributor for a free trial of the model that fits your job.

THOR BW-2

5 h.p. rotary air motor • 3 wheel reinforced heavy-duty rig • Variable speed control • Motor and controls movable along mast • Wet or dry operation • Mast swings 360° vertical and horizontal • New centralizer swings out of way for close drilling • 800 to 1000 lbs. pulling power for steel removal • Spring buffer prevents chain breakage • Equipped with Thor 105 drifter. (4" bore)

Thor PORTABLE POWER TOOLS

THOR POWER TOOL COMPANY, AURORA, ILL.

Atlanta	Chicago	Detroit	Newark	St. Louis	Export Division,
Birmingham	Cincinnati	Houston	Long Island City, N.Y.	San Francisco	New York City
Boston	Cleveland	Los Angeles	Philadelphia	Seattle	
Buffalo	Denver	Milwaukee	Pittsburgh	Toronto Canada	

James E. Castle

James Castle Named Manager Of International Minerals Div.

James E. Castle has been appointed manager of the Industrial Minerals Division of International Minerals & Chemical Corporation, according to an announcement released by Norman J. Dunbeck, vice-president in charge of the division. He will have his headquarters at the corporation's main offices in Chicago.

Mr. Castle has had extensive mining experience in this country and abroad. He comes to International from Foote Mineral Company, having served as plant manager at Kings Mountain, N. C.

A $4,000,000 expansion plan has been started by the Diamond Portland Cement Company in Middle Branch, Ohio, where the extended facilities are expected to increase the firm's annual output to 2,400,000 barrels. June, 1957, has been set as the date of completion.

Donald G. WOODFORD has been named assistant to the general sales manager for the Kaiser Gypsum Company.

Lime Sales for August, 1955 Hit 830,608-Ton Record High

Domestic sales of open-market lime in August, 1955, reached an all-time high of 830,608 short tons, according to reports of producers to the U. S. Bureau of Mines.

Increases were noted in all of the major categories — agricultural, 76 percent; refractory, 12 percent; building, 5 percent; and chemical and industrial uses 11 percent.

The table below shows sales by types and major uses.

Lime Sold by Producers[1] in the United States, in Specified Periods of 1954-55, by Types and Major Uses, in Short Tons

	July	August		January-August[2]	
	1955	1955	1954	1955	1954
By types:					
Quicklime	581,142	652,610	469,097	4,721,709	3,642,548
Hydrated lime	162,867	177,998	163,159	1,322,957	1,253,665
Total lime[3]	744,009	830,608	632,256	6,044,666	4,896,213
By uses:					
Agricultural:					
Quicklime	3,328	9,822	8,347	56,718	50,545
Hydrated lime	9,635	12,998	14,511	125,748	141,997
Total	12,963	22,820	22,858	182,466	192,542
Building:					
Quicklime	21,966	25,767	16,294	171,041	127,342
Hydrated lime	92,733	95,036	90,242	686,766	642,255
Total	114,699	120,803	106,536	857,807	769,597
Chemical and other industrial:					
Quicklime	364,094	401,635	307,193	2,912,914	2,322,861
Hydrated lime	60,499	69,964	58,406	510,443	469,413
Total	424,593	471,599	365,599	3,423,357	2,792,274
Refractory (dead-burned dolomite)	191,754	215,386	137,263	1,581,036	1,141,800

[1]Also includes a small quantity of captive tonnage (6-7 percent of the total reported herein) to maintain comparability with the annual lime statistics. The monthly canvass excludes the output of plants producing less than 10,000 tons a year.

[2]Approximately 60 percent of lime produced is high-calcium and 40 percent high-magnesium.

[3]Includes January-August revised figure.

11-Mo. Building Contracts Soar to $17,000,000,000— Nov. Totals Set Record

Led by industrial and commercial building, heavy construction contracts set a November record of nearly $1,400,000,000. This brings contract awards for the 11 months of this year to $17,000,000,000, far ahead of the $14,400,000,000 reported for the full year 1954 and the record $15,700,000,000 for 1952.

Private work—Industrial and commercial contracts provided the major impetus in November, going far to offset the tide of seasonal declines noted in other categories, particularly public works. At $298,000,000, industrial building was ahead of October. November was the second-best month of this year for industrial building—far ahead of the same month last year. Commercial awards were $155,000,000, or 29 percent ahead of October.

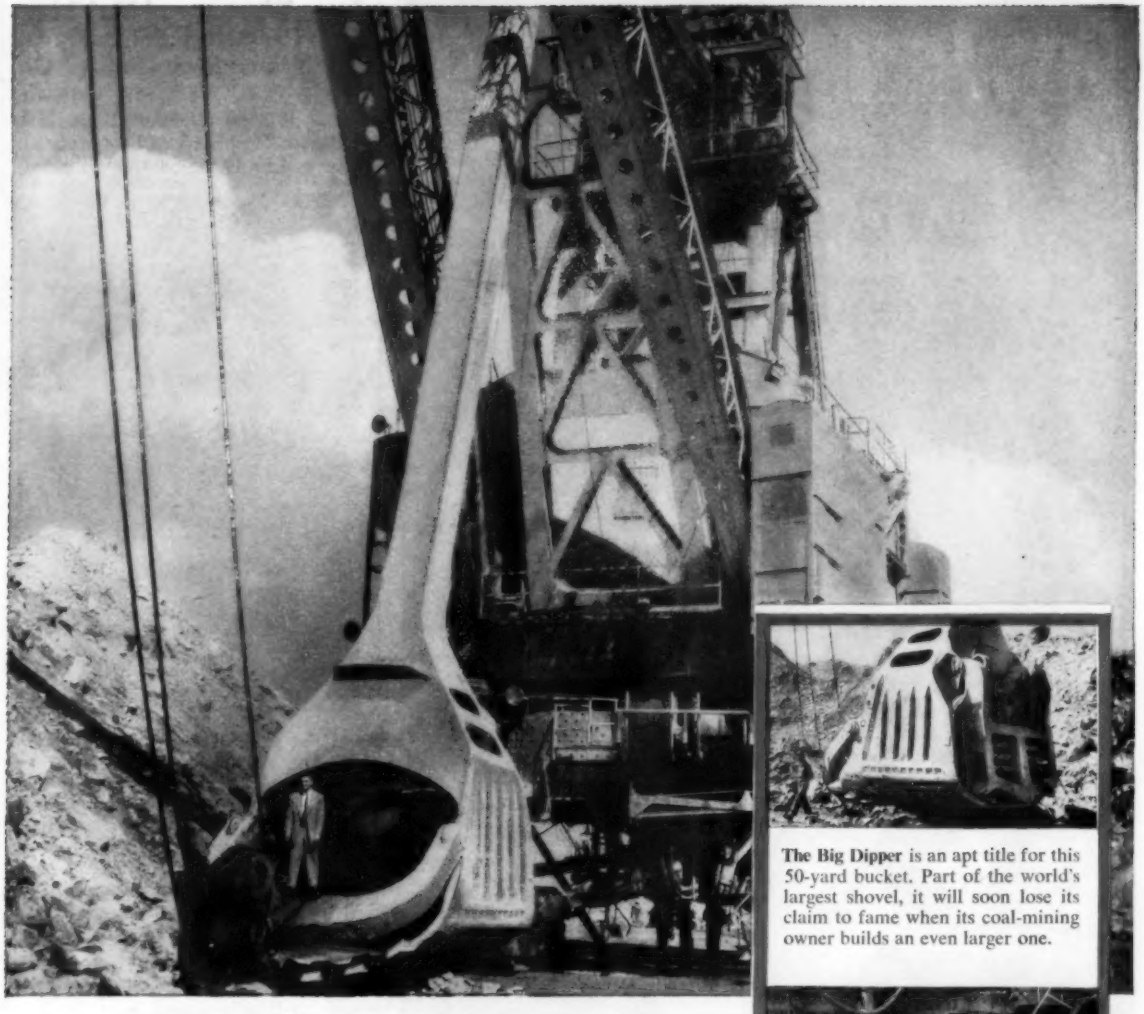
Mass housing continues the main support of the construction boom. Awards averaged nearly $100,000,000 a week. Although 27 percent off from October's very high volume, November awards were $393,000,000, which puts them 4 percent ahead of last year. The year-to-date volume is $5,700,000,000.

Other classes of private work are also running well ahead of 1954, with the minor exception of bridges. Industrial building is up 55 percent; and commercial is up 22 percent; and unclassified is up 68 percent.

Public work—Public contracts hit their low so far this year in November, with a total of $404,000,000. This volume was the lowest since February, 1954. The main reasons: a drop in highway awards to $118,000,000 from $159,000,000 last month; and a drop in the non-residential building total from $151,000,000 down to $86,000,000.

Four classes of public works are running below 1954 for the 11-month period. Buildings other than housing are down 3 percent. Bridges are down 2 percent, as are sewerage awards. Public housing is down 0.4 percent. But the following classes are well above last year—earthwork and waterways, 71 percent; unclassified, 29 percent; highways, 12 percent; waterworks, 11 percent.

Regions — Contract volume increased in most regions. It was up in the Far West, New England, the Mid-West, and the South. It declined sharply in the Mid-Atlantic, which up to now had led all other regions in percentage of gain over last year.



Find the Cities Service Lubrication Engineer

Henry Zielasko, the Cities Service Lubrication Engineer in this picture, may look small, but he's no drop in the bucket in the operation of the world's largest shovel.

The reason: Henry supplies the gear lubricants—Cities Service Trojan L Compounds—for *all* the equipment owned by this giant mining company. And, to get the job, his Cities Service lubricants had to prove their superiority in rigid tests against those of every major competitor.

Henry, and the many other skilled Cities Service Engineers like him, are prepared to prove the merits of themselves and their products to you in the same manner. Put them to the test! Call your nearest Cities Service office, or write: Cities Service Oil Co., Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

The Big Dipper is an apt title for this 50-yard bucket. Part of the world's largest shovel, it will soon lose its claim to fame when its coal-mining owner builds an even larger one.

Quiet, Cities Service at Work! In the mammoth gears beneath the shovel, Cities Service Trojan L Compounds give outstanding lubrication. They were chosen by the owner for all mechanized equipment.

Even the Trucks are Giants! Each big Euclid carries a 60-ton payload. Gear failure would be extremely costly. But that's no problem with Trojan L Compounds for lubrication.

OWEN BUCKETS

Reduced Costs in Countless Hopper Operations

Photo Courtesy of Thew Shovel Co.

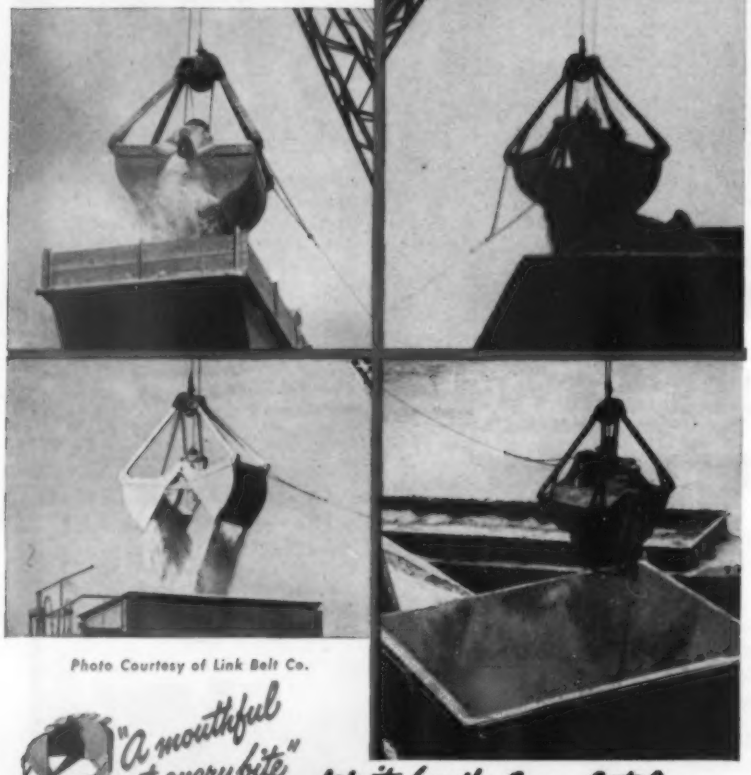


Photo Courtesy of Link Belt Co.

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Law, Wyman and Matthews Win Executive Promotions With Lone Star Cement Co.

The election of Walter F. Law as vice-president of the Lone Star Cement Corporation has been announced by H. A. Sawyer, president.

Walter F. Law

He will serve in New York as executive assistant to Mr. Sawyer.

Mr. Law has been associated with Lone Star since 1925, when he joined the corporation as a sales representative. In 1945 he was named sales manager of the firm's Pennsylvania Division, and since July, 1949, he has held the post of vice-president and manager of the Alabama Division at Birmingham.

B. L. Wyman Jr. succeeds Mr. Law as vice-president and manager of the Alabama Division. He has been with Lone Star since 1925 and was appointed assistant sales manager in 1945. He has served as Alabama Division sales manager until his new appointment.

Succeeding Mr. Wyman at Birmingham is C. S. Matthews, who has been associated with the corporation since 1934. In the past he has been a sales representative and assistant division salesmanager.

A new 1,000-cu. ft. capacity, 135-ft. long barge was launched recently for the Ideal Cement Company by the Pacific Coast Engineering Company at the Alameda, Calif., ship yard. Christened the *No. 20,* the barge is the fifth such vessel to be purchased by Ideal for carrying shell from the deposit site near San Francisco to the cement plant in Redwood City.

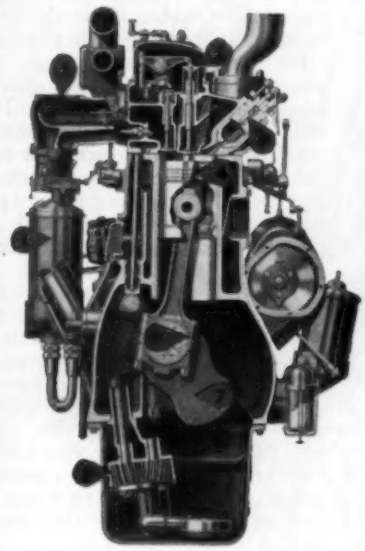
1 FULL FLOW OIL FILTER—Before oil goes under pressure to engine bearings, all harmful particles are removed by replaceable plastic-impregnated, full-flow filters.

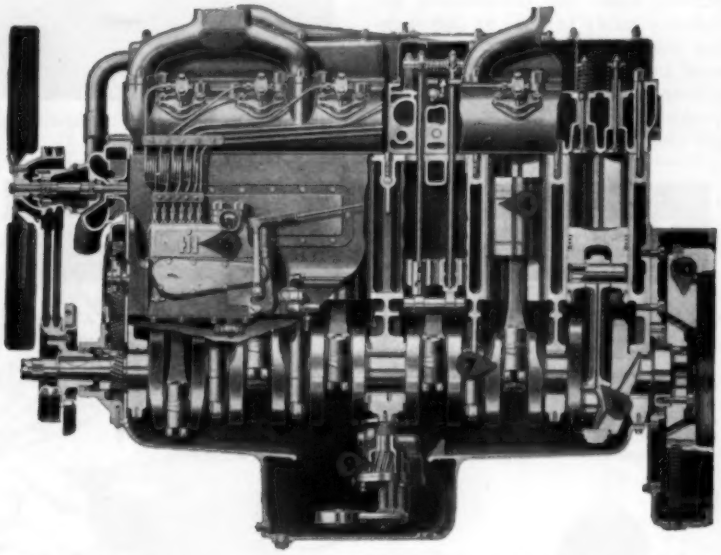
2 POSITIVE ROTATORS EXTEND VALVE LIFE. Exhaust valve rotators keep valves turning, at all engine speeds, distributing heat uniformly around the valves to keep deposits from building up on stems and seats, and also to prevent sticking, scuffing, and burning.

3 POSITIVE ALL-WEATHER STARTING. Seconds-fast, International Diesels start in coldest weather on exclusive gasoline starting system. Cylinders are pre-heat conditioned to give complete, clean combustion, instantly, on switching to operation on Diesel fuel.

4 ALUMINUM-ALLOY PISTONS have a thick crown at the top for rapid dissipation of excess heat direct to the cooling water. Hardened, replaceable, cylinder sleeves, three compression rings, with top ring chrome-plated, plus two oil control rings assure long-lasting, gas-tight seal for high compression ratios of over 15 to 1 . . . providing top fuel and oil economy.

5 SIMPLE, SINGLE-HOLE, INJECTION NOZZLE and pre-combustion chamber set at 45° angle for smooth, clean combustion of low grade No. 2 fuel oil under all engine speed and load conditions.





6 NEW IH INJECTION PUMP: Single plunger type on four-cylinder models, twin-plungers on six-cylinders . . . provide all cylinders equal amounts of fuel, precisely metered to load, whether for idling, maximum horsepower, or maximum torque under overload. New, harder injection plungers have up to four times longer life.

7 HEAVY-DUTY FORGED CRANKSHAFT with large diameter, induction-hardened journals provides long-lasting, wear-resistant bearing surfaces . . . rifle-drilled for full pressure lubrication . . . dynamically balanced for smooth operation.

8 REPLACEABLE TRI-METAL BEARINGS provide precision clearance for full-pressure lubrication and thousands of hours of heavy-duty work. Smooth electroplating of white alloy metal over copper-lead, precision bonded to a steel back, carries heavy loads with minimum friction.

9 FULL-PRESSURE LUBRICATION for long life. Big, gear-type pump delivers oil under controlled pressure through full-flow filters and rifle-drilled passages to main and connecting rod bearings, piston pins, camshaft, timing gears, and valve rocker arms.

10 HEAVY FLYWHEEL helps to maintain uniform speed under widely varying load conditions. Available to match standard makes of clutches, fluid couplings, and torque converters.

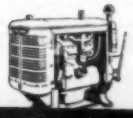
Hour after hour. . year after year

INTERNATIONAL ENGINES

. . . stay on the job with least upkeep

All International engines are built throughout to give you a full measure of power that stands up and stays on the job. They are precision-manufactured of thoroughly tested materials under continuous, quality-control inspection. Pressure lubrication through rifle-drilled crankshafts and internal passages assures trouble free performance. Inbuilt precision is fully protected from dirt and grit under the worst of job operating conditions by the best of fuel, oil, and air filters.

Heavy-duty radiators, power take-offs, and other factory-engineered power unit components are available to fit these long-life, money-saving engines to your job requirements. You can also get them as original equipment in most makes of construction machines. Call your nearest International Industrial Power Distributor or Power Unit Dealer for all the facts.



There's a size and type of International engine to fit your needs . . . from 16½ to over 200 hp.

INTERNATIONAL HARVESTER

INTERNATIONAL
INDUSTRIAL POWER

MAKES EVERY LOAD A PAYLOAD

Portland Cement Assn. Honored for Performance By National Safety Council

The Portland Cement Association has been presented the National Safety Council award for outstanding safety performance for the second successive year.

Ned H. Dearborn, president of the N.S.C., made the presentation for industry safety in 1954 at the opening session of the Association's annual meeting in Chicago. The association also received the award last year and in 1951, the first year it was presented.

Ned H. Dearborn (left) presents safety plaque to Walter H. Wulf.

Accepting the award and plaque for the P.C.A. was Walter H. Wulf, president of the Monarch Cement Company and chairman of the Accident Prevention Committee of the association.

Announcement that the P.C.A. was one of 11 associations honored by the Safety Council for outstanding work in promoting industrial safety had been made October 19, at the 43rd National Safety Congress in Chicago.

For the second straight year, the association set all-time safety records for the industry in the year 1954. The 152 member company operations (plants and quarries) achieved record low-injury frequency and severity rates of 3.38 disabling injuries per million man-hours worked and .92 days lost and charged per thousand man-hours worked, respectively.

These achievements resulted in the Association membership having the most favorable output-injury ratio in the 39-year history of their accident prevention activities. The record was established in a year in which the industry set a new production high. The record ratio of more than 1,000,000 bbl. of portland cement produced per disabling injury in 1954 was 47 percent more than the 1952 figure and 15 percent above 1953.

New Oklahoma Cement Firm To Build $2,000,000 Plant

Construction of a $2,000,000 cement plant in Locust Grove, Okla., followed an announcement made by Hersal Wilkinson, a retail cement dealer in that city, that a new corporation had been formed.

Hercules Portland Cement Company, Inc., will build a new plant in the midst of a rich limestone deposit near Locust Grove, where production is expected to begin by April 1.

Mr. Wilkinson is president of the corporation; Kenneth Woodruff, Locust Grove, is vice-president; and Basil Georges, Tulsa, is secretary-treasurer.

The corporation came into being when Mr. Wilkinson and Mr. Woodruff, business associates in Locust Grove, investigated limestone deposits north of the city.

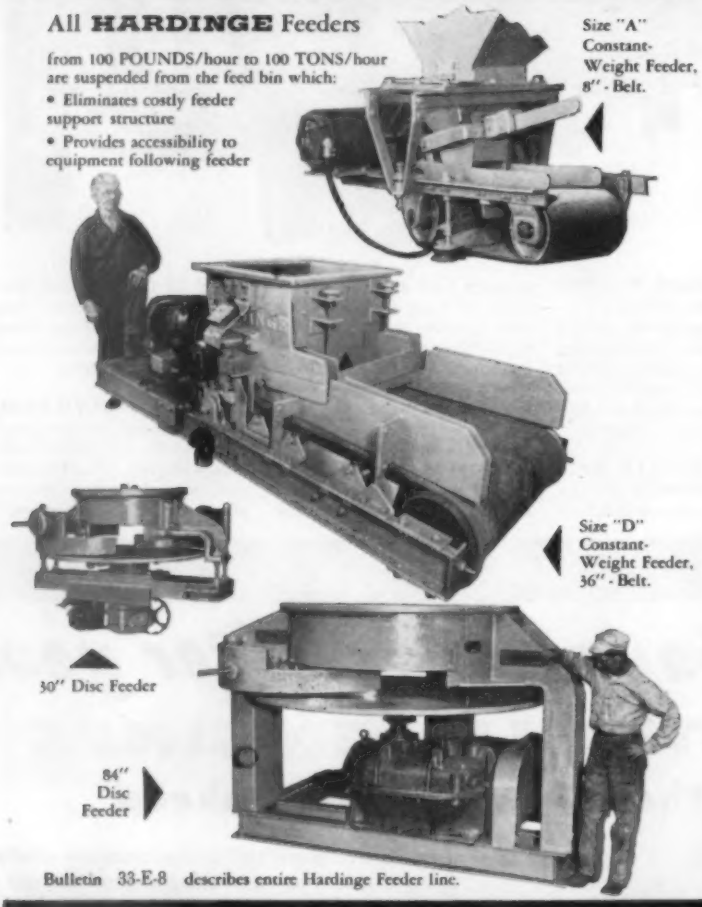
The deposit, described as a "lime shale section in the Fayetteville formation of the upper Mississippian", is considered to be of the finest quality and extends over 600 acres: it is expected to furnish a 100-year supply for the cement plant. According to Joseph M. Clark, Tulsa geologist, who is the corporation's consultant on the project, the new concern will be the first to utilize this type of limestone for the preparation of cement.

LOW INSTALLED COST

All HARDINGE Feeders

from 100 POUNDS/hour to 100 TONS/hour are suspended from the feed bin which:

- Eliminates costly feeder support structure
- Provides accessibility to equipment following feeder



Bulletin 33-E-8 describes entire Hardinge Feeder line.

HARDINGE COMPANY, INCORPORATED

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Albemarle Adage No. 5

"'Tis Better to Be 3 Hours Too Soon Than a Minute Too Late"

Albemarle anticipated your order for Multiwall Bags many years ago when it planted the seedling pines in its own forest preserves. Albemarle's is a completely integrated operation from woodlot to eye-catching designs printed in color on sturdy plain or colored Kraft.

You benefit by prompt deliveries, quickly shipped, that have been completely controlled by Albemarle all the way.

FOR *Multiwall* CALL A *lbemarle*

ALBEMARLE PAPER MANUFACTURING COMPANY • RICHMOND, VIRGINIA

EASTERN SALES OFFICE: NEW YORK CITY • SOUTHERN SALES OFFICE: BALTIMORE, MD. • MIDWEST SALES OFFICE: CHICAGO, ILLINOIS

Truck Safety Drive Launched By Dallas County Producers

Processors of sand and gravel and concrete manufacturers have united in Dallas County, Tex., to improve the industry's safety record. Sparked by a rising incidence of accidents involving sand-and-gravel trucks, and editorial comment to that effect in Dallas daily newspapers, Thomas L. Amis, president of Wamix, Inc., ready-mix concrete manufacturers, led the organization of the Concrete Industries Board of Dallas County.

Membership is composed of sand-and-gravel suppliers, of ready-mixed concrete producers, road and surface contractors, and contract haulers.

Pete Gifford of Gifford-Hill is vice-chairman of the board; J. Randall Cooper of Cooper Concrete, Jerry Lacy of L. H. Lacy Company, Lloyd Van of A.B.C. Concrete Company, Wes Pickens of Wesco, and Bill Handley of Blue Diamond are members of the executive committee.

The safety program launched by the board includes a self-policing system of traffic observers, designed to spot accident-prone drivers and to help improve driving practices in the industry without punitive police action.

Three who are plugging safe driving in Dallas County, Tex., are Thomas L. Amis, chairman, Concrete Industries Board; Charles Batchelor, deputy chief, Dallas Police Department; and Buster Rowden, Texas Department of Public Safety.

The New Model E Leahy® Unmatched for Screening Lime, Ag-Lime or Silica Sand

The simplified Model E Leahy with FlexElex heating is miles ahead of any other screen for the handling of difficult damp materials in the fine mesh range. Completely open mesh assured on long runs. No flexible electric connectors. No connections to make or break during jacket changes. New easy jacket tensioning. Utmost economy. Send for Bulletin 16-EH.

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911 Glasgow Avenue, Fort Wayne, Indiana

Is it worth 15¢ an hour to get rid of all the trouble you're having with blinded screens?

A SCREEN that's electrically heated is seldom mistreated. You can extend a screen cloth life as much as 800% when you eliminate rough cleaning methods (brush, torch, chain or hose). Increase production of agricultural limestone to meet any specification in any season. Your plant electrician can connect CONVERTA-SCREEN Heating Kits to existing equipment. Write for Bulletin A and see how easy!

any screen now in use can easily be equipped for efficient low-voltage resistance heating with

CONVERTA-SCREEN TRANSFORMER KITS

SCREEN HEATING *Transformers* INCORPORATED
428 Erie St. South • MASSILLON 81, OHIO

Lehigh Portland Cement Co. Expansion to be Enlarged

Officials of Lehigh Portland Cement Company have announced plans to construct additional concrete silos for the storage of cement at the plant in Buffalo, N. Y., this spring. Improved packing facilities will also be installed.

This work is in addition to construction now under way on an addition to the present grinding mill, which is designed to increase the capacity of the plant about 20 percent.

Second Kiln Increases Output At Kentucky Light Aggregates

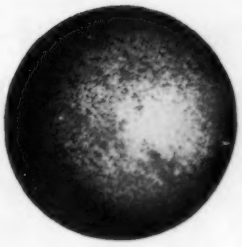
A new rotary kiln, 8 ft. in diameter and 125 ft. long, has been installed at Kentucky Light Aggregates, Inc., Shelbyville, where the former output of aggregate is expected to be doubled.

Increased demand for expanded-shale aggregate used in making lightweight concrete block and other products caused the corporation to install the kiln. There will be four kilns when proposed expansion plans have been completed.

Aggregates & Construction Products Ltd., Regina, Sask., has opened a new $300,000 lightweight aggregate plant at Regina. Nearby clay deposits will be used to manufacture an estimated 300 cu. yd. of aggregate daily. The company has announced that it intends to build a $1,250,000 sewer pipe manufacturing plant near Regina.

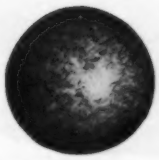
IN GRINDING MATERIALS

your best buy is CF&I



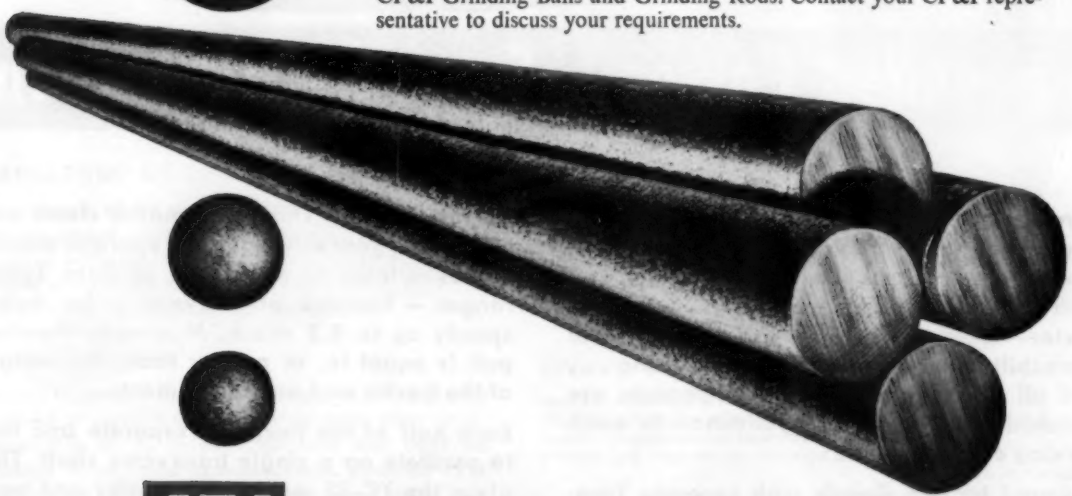
. . . AND HERE'S WHY: All grinding balls look alike, and cost pretty much the same. This holds true for grinding rods, too. This being the case, the best way to buy is on the reputation of the manufacturer and the performance record of his products.

CF&I, for example, has an established reputation as a leading manufacturer of quality products for use in the mining industry. Having grown up in close geographical proximity to the western mining industry, CF&I has gained unmatched "know-how" in the production of grinding materials. It is this "know-how," applied at every point in the manufacturing process from ore to finished product, that assures you of getting the best when you specify CF&I Grinding Balls or Rods . . . whatever your grinding application.



As for product performance, CF&I Grinding Balls, forged from special analysis steel, have an ideal balance between toughness and hardness . . . are well known for their optimum grinding ability and wearability. And CF&I Grinding Rods, also made from special analysis steel, machine straightened, and with square-cut ends, have an established reputation for efficiency and economy in grinding operations.

Whatever your grinding material needs, it will pay you to consider CF&I Grinding Balls and Grinding Rods. Contact your CF&I representative to discuss your requirements.



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Biggest tractor news in years...

Unequalled Power...Smoother Operation...

Here's a completely new concept of crawler tractor design and performance . . . the new TC-12 Twin-Power Euclid. It's designed and built to give you all the features you want in a tractor—more power, easy operation, greater workability and accessibility for servicing . . . and all of the power train components are matched, with years of application in earth moving equipment.

Powered by two diesels with separate Torqmatic Drives for each track, the TC-12 has 365 h.p. available for tractive effort — a smooth steady flow of power to meet any job requirement. There's no master clutch and no manual gear shifting . . . the operator simply moves a lever to select one of three speed ranges — forward and reverse — for travel speeds up to 8.3 m.p.h. Maximum drawbar pull is equal to, or greater than, the weight of the tractor and any attachments.

Each half of the tractor is separate and free to oscillate on a single transverse shaft. This gives the TC-12 maximum stability and traction on rough ground. The tractor can be easily separated into two halves for shipment when necessary.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Never before so much WORKABILITY!

the "Euc" TC-12 Twin Crawler

INDEPENDENT TRACK DRIVES

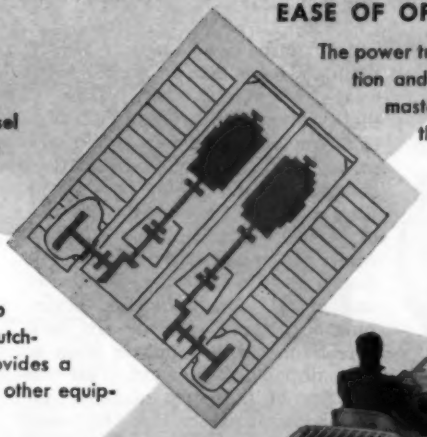
"Hair trigger" control of steering at all times and in any speed range, forward or reverse, is a result of each track having a separate power train. Spin turns, fast and tight, can be made by reversing one track and keeping the other in forward speed. Routine steering is done easily by putting one transmission lever into neutral and using the track brake. Fast, easy steering is one of the outstanding design and performance features of the "Euc" TC-12.

TWIN ENGINES

With 365 h.p. delivered to the power train, the TC-12 has far more horsepower than any other "big" tractor . . . and the weight to use this power as tractive effort. It develops greater drawbar pull at faster travel speeds . . . a mighty important feature for work with rubber tired scrapers and other crawler applications. A top travel speed of 8.3 m.p.h. and faster speeds in the working ranges give the TC-12 a big advantage in workability.

TORQMATIC DRIVES

Each track is driven by a GM 6-71 diesel through a separate Allison Torqmatic converter and transmission. Shifting from one of the three speed ranges to another can be done under full power with no loss of motion . . . the tractor can be shifted into reverse while moving forward so there's no lost time for stopping and clutching. The power train of the TC-12 provides a steady flow of power that's matched to other equipment and job requirements.



EASE OF OPERATION

The power train of the TC-12 provides simple operation and a smooth flow of power. There is no master clutch . . . shifting from one of the three speed ranges to another is done under full power with no loss of momentum. There's no delay for stopping or clutching. Independent track drives gives this "Euc" fast, easy steering under all job conditions.

More Workability

RADIATORS AT REAR

Rear location of the cooling system maintains efficient engine operating temperatures and provides better front visibility for the operator. Hinged radiator hoods make it a simple matter to change a fan belt or to service the radiator.

ACCESSIBILITY

Unitized assemblies are all easy to get at—they can be removed or serviced without tearing down other parts. Accessibility of all major components that can't be equalled in any other crawler—keeps downtime to a minimum. All lubrication fittings and check points are located for easy servicing—fuel tanks have ample capacity for full shift operation.

SPECIFICATIONS

total h.p.—388 h.p. at rated speed
available for tractive effort—365 h.p.
speeds—3 speed ranges forward and reverse to 8.3 mph
drawbar pull (bare tractor)—forward and reverse—
54,000 lbs. low range
53,500 lbs. intermediate
53,000 lbs. high range

track width (standard shoe)	**26″**	**track gauge**	**110″**
overall width	**11′ 4″**	**overall length**	**16′ 2″**
height (excluding stacks)	**7′ 11″**	**drawbar height**	**23″**
ground clearance	**20″**	**operating weight (bare)**	**approx. 58,000 lbs.**

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

30 Years ago in Pit and Quarry

By WALTER E. TRAUFFER

THE January 1, 1926, issue of PIT AND QUARRY was a pre-convention issue, containing the complete programs for several coming meetings. These included the National Crushed Stone Association Convention and machinery exposition at the Mount Royal Hotel, Montreal, Quebec, January 18 through 21, 1926, and the National Sand and Gravel Association convention at the Atlanta Biltmore Hotel, Atlanta, Ga., January 19 through 21, 1926. The second meeting of the Concrete Products Division of N.S.G.A. was to be held concurrently. E. W. Dienhart, who was then general manager of the Acme Concrete Products & Gravel Company, Cement City, Mich., and a well-known authority on concrete products, was to preside as chairman of this meeting. The third program was that of the American Road Builders Association, to be held in Chicago from January 11 to 15, 1926.

Another feature of this issue and of the following January 15, 1926, issue was an article in two installments on the operations of the Blue Diamond Company of Los Angeles, Calif., said to be the largest building materials company in the world. This was a story not only of a company but also of its president, William C. Hay, who 10 years before found himself in possession of a large deposit of sand and gravel in Los Angeles. Beginning on a small scale, he first built a ready-mixed lime mortar plant to help dispose of the sand. This was the first of the chain of Blue Diamond mortar plants which for many years dominated that industry in all parts of the country. Sand and gravel, crushed stone, and gypsum were later added to the Blue Diamond line, and in each of these the same ingenuity and resourcefulness made these successful operations in spite of numerous handicaps. The gypsum deposit was a particular challenge as it lay near the top of a mountain in the desert 30 miles southwest of Las Vegas, Nev. A complete description was given of all the company's plants and of the problems which had to be overcome in their development and operation.

Also described in these issues were the sand and gravel plants of the Midway Sand & Gravel Company near Marietta, Ohio, the Johnston Clay Works, Inc., Fort Dodge, Iowa, and the Oregon Gravel Company, Salem, Oregon. There was also a general article on sand and gravel production in the Rio Grande Valley of Texas by four plants. The crushed stone industry was represented by the new operation of Adolphus Florentine at Plattsburg, N. Y.

An interesting asbestos plant described was that of the Maple Leaf Asbestos Corporation at Thetford Mines, Que. A dimension granite plant and a slate quarry were also described.

N.S.G.A.-N.R.M.C.A. Convention

(*From page* 26)

crete"—Stanton Walker, director of engineering, and D. L. Bloem, assistant director of engineering

"The Role of Calcium Sulphate in the Manufacture of Portland Cement"—W.C. Hansen, Universal Atlas Cement Company, Buffington, Ind.

The Association's Cement Testing Program—Stanton Walker, director of engineering

"Producing Cooled Concrete"—Harry Irwin, Warner Company, Philadelphia, Pa.

9:30—Session 6—N.S.G.A. and N.R.M.C.A.

"The Associations' Group Insurance Plan Is a Good Investment for My Company"—William Moore, J. P. O'Connell Co., Boston, Mass.

"The Los Angeles Strike"—Vernon Lohr, California Materials Co., Whittier, Calif.

Panel Discussion of Labor Negotiations in Key Areas in 1955—Norman J. Fredericks, Koenig Coal & Supply Co., Detroit, Mich.; Raymond F. Powell, Concrete Incorporated, St. Louis, Mo., and James A. Nicholson, Nicholson Concrete Co., Toledo, Ohio

"The Industry Wage Pattern in 1955"—Kenneth E. Tobin Jr., assistant executive secretary

12:30—Joint luncheon. Address by the Hon. Douglas McKay, Secretary of the Interior, Washington, D.C.

THURSDAY, FEBRUARY 16

9:30—Session 7—N.S.G.A.

"Classifying Sand with Water"—E. L. Shoemaker, Warner Company, Philadelphia, Pa.

"Exploration of Sand and Gravel Deposits"—Frank C. Sturges, Pennsylvania Drilling Company, Pittsburgh, Pa.

"Abrasion Resistant Materials Used in Sand and Gravel Production"—William L. Price, engineering director, Keystone Division, Dravo Corp., Pittsburgh, Pa., and Donald H. Marlin, research engineer, Dravo Corp.

"Tricks of the Trade"—An open forum discussion of operating problems based on answers to a questionnaire distributed to the membership.

9:30—Session 8—N.R.M.C.A.

"Points to Check Before Selling on Basis of Guaranteed Strength"—Stanton Walker, director of engineering

"Now That the Job Is Sold, What Are You Going to Do About It?"—E. J. Nunan, The Buffalo Slag Co., Inc., Buffalo, N.Y.

"A Co-operative Program for Promoting Ready Mixed Concrete for City Street Paving"—Ross Wilcox, Portland Cement Association, Chicago, Ill.

Panel discussion of merchandising practices in the ready mixed concrete industry with audience participation—Quentin W. Best, Consolidated Rock Products Co., Los Angeles, Calif.; John B. Donovan, Valentine Concrete Co., Springfield, Mass.; J. G. Goodner, The Dolese Co., Oklahoma City, Okla., and F. Edwin Schouweiler, Old Fort Supply Co., Inc., Fort Wayne, Ind.

2:00—Session 9—N.S.G.A. and N.R.M.C.A.

"Does the Federal Wage and Hour Law Apply to Your Employees?"—Charles A. Horsky, Counsel for two associations

"Eligibility Standards for Use of Indus-

IT COSTS NO MORE TO USE THE BEST

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The Frog, Switch & Mfg. Co. CARLISLE, PA.
ESTABLISHED 1881

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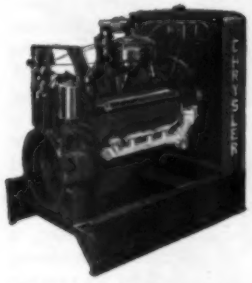
... best-engineered, most-economical answer to your power problem

Chrysler Power is the *dependable*, economical, lightweight answer to your high-speed or high-torque power requirements. Within their power ranges, each Chrysler Industrial Engine is a leader in the field and is recognized as such by manufacturers of almost every type of self-powered equipment.

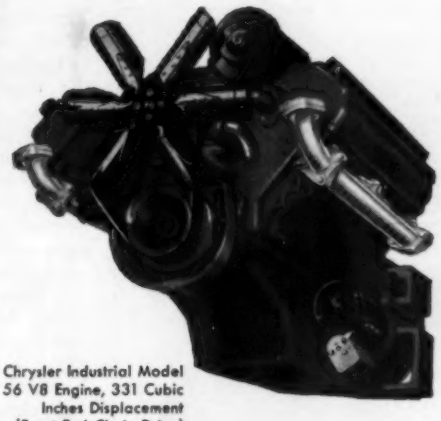
Check the specifications. Note the optional equipment which can be factory supplied or installed to meet the particular requirements of your equipment in the field. Whether equipped for Gasoline, Distillate Fuel, Propane or Natural Gas operation, Chrysler Industrial Engines offer definite advantages . . . performance, ease of maintenance, fast parts service, low initial and operating costs.

See the dealer nearest you, or write for complete information. ***Dept. 121, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.***

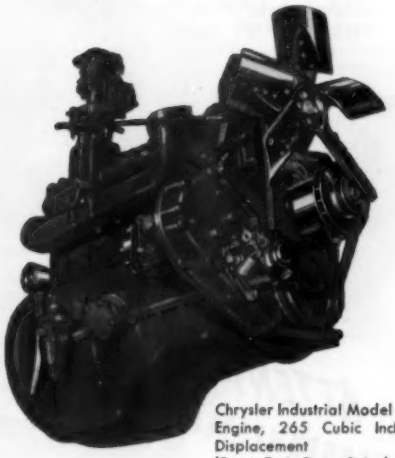


Chrysler Open Power Units. The open power units for all engines include the complete engine, skid base, radiator, instruments and instrument panel, flywheel and flywheel housing. Open power units for V-8 Models Ind. 52 and 56 (pictured), include twenty-five gallon fuel tank.

Chrysler Enclosed Power Units. The enclosed power units have the complete engine, fuel tank (Models Ind. 30, 31, 32 and 33—sixteen gallon. Models Ind. 52 and 56—twenty-five gallon), storage battery, instruments and instrument panel, flywheel, flywheel housing, skid base and completely enclosing sheet metal.



Chrysler Industrial Model 56 V8 Engine, 331 Cubic Inches Displacement (Front End Chain Drive)



Chrysler Industrial Model 33 Engine, 265 Cubic Inches Displacement (Front End Gear Drive)

Optional Equipment—Chrysler Engines

- Chrysler Industrial Torque Converter
- Chrysler gyrol Fluid Coupling
- Three, Four or Five-Speed Transmission
- Twelve or Twenty-four Volt Electrical System
- Distillate, Propane or Natural Gas Burning Carburetor
- Over-Center Clutch and Power Take-Offs
- Vertical or Horizontal Magnetos
- Flexible Coupling for Truck-Type Flywheel
- Radio Shielding and Ignitors
- Heavy-Duty Oil Bath Air Cleaners
- Safety Switches (Low Oil Pressure, High Water Temperature)
- Corrosion or Fungus Resistant Electrical System

GENERAL SPECIFICATIONS ALL MODELS

	Ind. 30	Ind. 31	Ind. 32	Ind. 33	Ind. 52	Ind. 56
No. of Cylinders	6	6	6	6	8	8
Type of Engine—4 Cycle	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Bore—Inches	3¼	3¼	3⅞	3⅞	3⅞	3 13/16
Stroke—Inches	4⅝	4⅝	4¾	4¾	3¼	3⅝
Displacement—Cu. In.	230	230	265	265	270	331
Compression Ratio	7.0	7.0	6.8	6.8	7.5	7.5
Valves—Arrangement	L	L	L	L	Vee	Vee
Pistons—No. Rings	4	4	4	4	3	3
Crankshaft—Bearings	4	4	4	4	5	5
Camshaft Drive	Silent Chain	Gear	Silent Chain	Gear	Silent Chain	Silent Chain
Camshaft—Bearings	4	4	4	4	5	5
Crankshaft—Bearing Diameter	2½"	2½"	2½"	2½"	2⅜"	2½"
Lubrication—Type	Press.	Press.	Press.	Press.	Press.	Press.
Lubrication—Type Oil Pump	Rotor	Rotor	Rotor	Rotor	Rotor	Rotor
Lubrication—Oil Capacity Qts.	5	5	5	5	5	5
Ignition—Battery Type	Yes	Yes	Yes	Yes	Yes	Yes
Spark Plug—Size	14 mm	14 mm	14 mm	14 mm	14 mm	14 mm
Starting—Elec. Type	6 Volt	6 Volt	6 Volt	6 Volt	6 Volt	6 Volt
Gen. Reg.—Full Voltage	45 Amps.	45 Amps.	45 Amps.	45 Amps.	45 Amps.	45 Amps.
Gen. Reg.—Full Voltage and Current Control	Yes	Yes	Yes	Yes	Yes	Yes
Carburetor—Type	Down-Draft	Down-Draft	Down-Draft	Down-Draft	Down-Draft	Down-Draft
Fuel Pump	Yes	Yes	Yes	Yes	Yes	Yes
Weight—Approx. (Lbs.)	575	610	740	760	591	845

Specifications subject to change without notice.

HORSEPOWER WITH A PEDIGREE

CHRYSLER INDUSTRIAL ENGINES

INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

trial Radio"—Ernest Jennes, Counsel for two associations

Panel discussion on use of industrial radio in sand and gravel and ready-mixed concrete operations—William J. Hicklin Jr., Capitol Concrete Co., Jacksonville, Fla.; Russell P. Mumford, Beckley & Myers Concrete Co., Springfield, Ohio; James Sadler, Southern Materials Co., Inc., Richmond, Va.; and M. Eugene Sundt, Albuquerque Gravel Products Co., Albuquerque, N.M.

2:00—Session 10—N.R.M.C.A.

Review of progress in aggregate specifications and test methods—Stanton Walker, director of engineering

"Sawed Joints for Concrete Pavements"—John E. Burke, Illinois Division of Highways, Springfield, Ill.

"Effects of Crushed-Gravel Fine Aggregate on the Strength of Asphaltic Surfacing Mixtures"—W. H. Goetz, Joint Highway Research Project, Purdue University, Lafayette, Ind., and R. P. Lottman, National Sand and Gravel Association Fellowship, Purdue University

"Properties of Sand and Gravel for Railroad Ballasts"—Rockwell Smith, Association of American Railroads.

George Combs of Combs, Inc., Ottumwa, Iowa, has announced that rebuilding of the fire-damaged equipment at the plant has begun. A large motor, pump, and other pieces of machinery were destroyed and a 22-by 50-ft. barge was damaged.

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Pittsburgh Coke Expanding Neville Island Facilities To 2,000,000 Bbl. per Year

Pittsburgh Coke & Chemical Company has started on a $500,000 expansion of its cement manufacturing facilities on Neville Island, according to an announcement by President Henry L. Hillman.

The expansion will increase the company's annual cement capacity by 400,000 bbl., and by spring the total capacity will exceed 2,000,000 bbl. For several years cement demand has exceeded the company's capacity, in spite of earlier expansions. The demand for cement in the company's marketing area is expected to receive additional impetus during the next few years because of a number of river dams and sewage system projects already authorized and under way.

Pittsburgh Coke has been a pioneer in the use of blast-furnace slag, a by-product of its basic operations, as a principal ingredient in cement manufacture. The resulting product, known as portland-pozzolan cement, has demonstrated excellent stability under severe conditions. As a result, portland-pozzolan cement has become increasingly popular and has virtually replaced the conventional portland cement in Pittsburgh Coke's product line. A number of major cement companies which have access to a blast-furnace slag supply have followed in adding portland pozzolan to their lines.

Republic Cement Corporation Building Plant Near Manila

Construction has started in Norzagaray, Bulacan, near Manila in the Philippine Islands, on the Republic Cement Corporation's new 2,500 bbl. capacity cement plant.

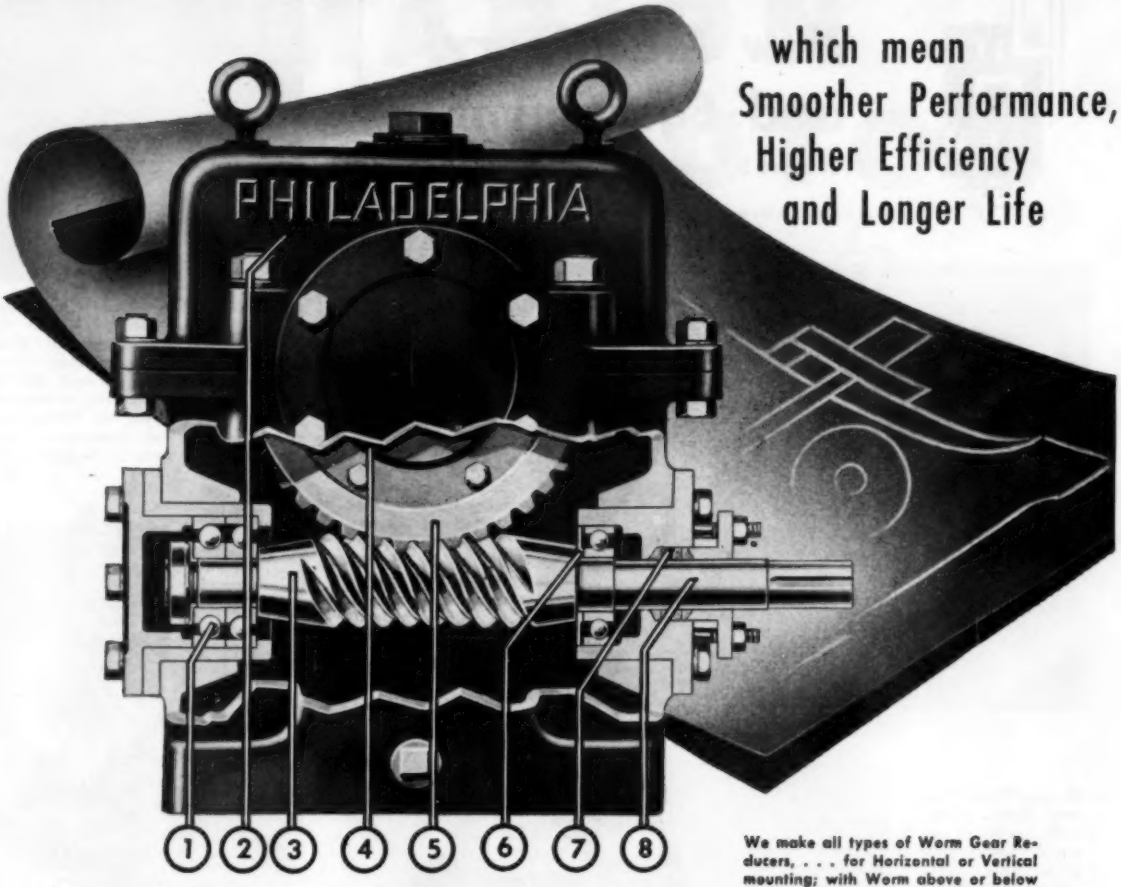
With nearly all the corporation's stock in Filipino hands, the Republic Cement Corporation is a private enterprise. Machinery has been furnished by Kluckner-Humboldt-Deutz Company, a German manufacturer.

HENRY SLOAN, former plant engineer at the Cementon plant of the Alpha Portland Cement Company, has been appointed superintendent of the company's La Salle, Ill., plant.

JOSEPH TEMM, former manager of the La Salle plant, whom Mr. Sloan is replacing, is now at Cementon as superintendent for the Macdonald Engineering Company of Chicago. Macdonald is presently completing a $5,000,000 expansion and modernization project at the Alpha plant in Catskill, N. Y.

YOU GET ALL THESE ADVANTAGES...

which mean Smoother Performance, Higher Efficiency and Longer Life



1____ **BEARINGS** throughout are of highest quality, calculated to take all loads and stresses in accordance with maximum ratings of units.

2____ **EXCEPTIONALLY RIGID HOUSING** of best grade cast iron . . . Strengthening ribs integral with design.

3____ **WORMS** made of SAE 3115 Steel with carburized and hardened threads. Shaft and threads smoothly ground after hardening.

4____ **GEAR SHAFT BEARINGS** run in an oil well that automatically fills with fresh oil when filled from top. Splash from the gear keeps the wells filled to the overflow point.

5____ **WORM GEAR** made from quality chill cast nickel bronze bolted to a semi-steel center. (Smaller sizes are solid bronze.)

6____ **WORM AND WORM BEARINGS** run in oil bath. Baffle plates prevent flooding.

7____ **WORM SHAFT** equipped with stuffing box to prevent oil leakage.

8____ **SHAFTS** are premium quality. Always accurate, straight, concentric.

We make all types of Worm Gear Reducers, . . . for Horizontal or Vertical mounting; with Worm above or below Worm Gear; in Single, Double or Triple Reductions for medium or heavy duty service; any horsepower or reduction ratio.

Tell us your Speed Reduction problems, and a Philadelphia Sales Engineer will gladly call upon you, . . . without obligation.

Catalog WG-51 sent upon request on your letterhead.

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Industrial Gears & Speed Reducers

LimiTorque Valve Controls

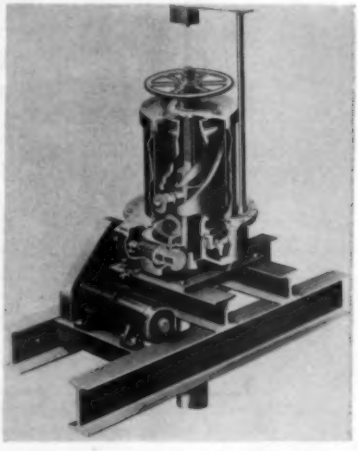
Established 1892

New Machinery and Equipment

(For more information, use card on p. 99)

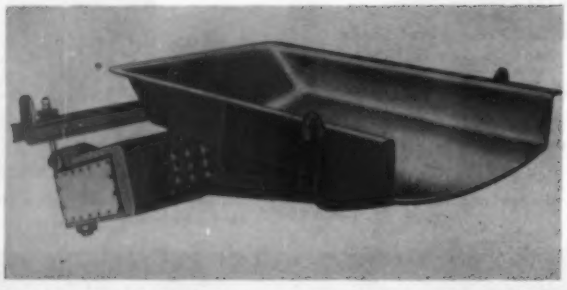
● The arm of a workman picks clean a new single 14-in. permanent plate magnet installed above a conveyor belt. Manufactured by Eriez Manufacturing Company, this magnet has proved most effective in ridding nonmetallic minerals of tramp metal particles. Non-electric, the magnet consists of Alnico V metal, contained in a steel housing, and is versatile in application. ↑ (52)

● Newest in the line of LoDal, Inc., truck loaders is this hydraulic model which operates as a unit with one man and one machine. With a capacity of 3,000 lb., one or more trucks may be loaded at a time, with loading speeds up to 2 yd. per minute. It can be rigged to most 1½- to 4-ton capacity trucks. ← (51)

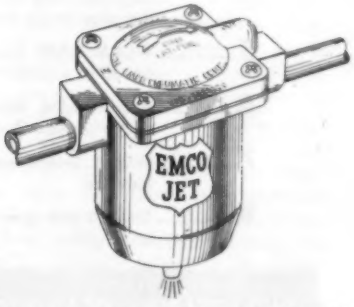


● Cut-away view of a thickner made by Hardinge Co., Inc., shows the most recent improvement in the line—the "Auto-Raise" mechanism for overload protection. This new design enables operation of sludge scrapers under conditions which normally cause stalling or damage. ↑ (54)

● Mack Trucks, Inc., new B-80 series, with gasoline or diesel powerplants, is available in 11 models, with a choice of four or six-wheeled types, and a variety of multi-speed transmissions. The four-wheeled models have a capacity of 46,000 lb., while the six-wheelers are listed from 55,000 to 65,000 lb. → (53)



● Equipped with a 48- x 60-in. flat pan trough, this F-55DT vibratory feeder, manufactured by the Syntron Company, is designed for complete protection against dust in the air or spillage from a supply hopper by the use of a new optional dust-tight design. This new feature on the heavy-duty "Vibra Flow" feeder encloses the magnet and leaf springs, and has a metal plate over the armature and core. All plates are bolted to the magnet casting against the sealing gaskets. A separate control box for wall mounting, operating on a 220-60 cycle, enables this feeder to reach a capacity of 500 tons per hour. ↑ (55)



● Newest of the air filters manufactured by the Emco Pneumatic Corporation is this fully automatic "Emco Jet", weighing just 12 ounces. All major parts are of aluminum and require no manual adjustment. The L200-A operates in a range of 1 c.f.m. to 20 c.f.m., with a 60- to 250-lb. capacity. ↑ (56)

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for Tough Jobs Ahead

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MACHINE	SHOVEL CAP. CU. YD.	SHOVEL BOOM LENGTH (EFF.)	HANDLE LENGTH (OVERALL)	MAX. CRANE BOOM LENGTH	MAX. CRANE RATING IN TONS @12' RAD. EXCEPT AS NOTED CRAWLER	TRUCK	WAGON	HOE CAP. CU. YDS.	ASK FOR BULLETIN NUMBER
MARION 32-M	¾	19'-6"	16'-4"	80'-0"	*17½	*25	*25	¾	416
MARION 43-M	1	22'-6"	16'-4"	100'-0"	*27	*35	—	1—1¼	415
MARION 362	1½	24'-8"	18'-2"	100'-0"	37	—	—	1½—2	398-D
MARION 372	—	—	—	100'-0"	43	—	—	—	—
MARION 83-M	2	24'-8"	18'-2"	120'-0"	60	—	—	2—2¼	414
MARION 87-M	—	—	—	140'-0"	75	—	—	—	—
MARION 93-M	2½	27'-4"	20'-0"	120'-0"	80	—	—	—	397-E
MARION 101-M	3	27'-4"	20'-0"	120'-0"	84	—	—	—	417
MARION 111-M	4	32'-0"	23'-8"	120'-0"	169	—	—	—	402-B

*Rated at 10' Radius in Accordance with General Practice.

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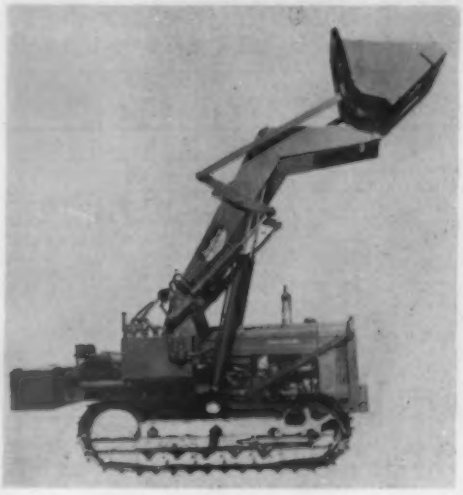
MARION POWER SHOVEL COMPANY
MARION, OHIO, U. S. A.

● A new line of quarry cars produced by the United States Steel Corporation are now available. The USS Man-Ten quarry car, capacity 231 cu. ft. level full, or 20,000 lb., has body-end and side plates of Man-Ten Steel. Pivoted on three steel rocker castings on each side, the cars are easy to unload. ↑ (57)

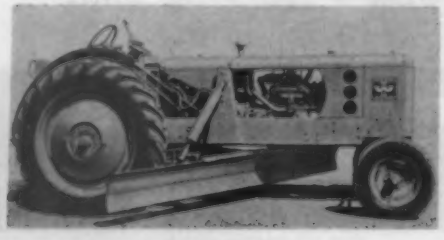
● Twin-Pin Connecting Links, manufactured by the Page Engineering Company, are of low cost design and can be installed quickly. This easy to use repair link is rugged and simple, enabling five minute repairs. Formed of two interlocking and identical halves, the Twin-Pin Link is inserted through the ends of the two sections of chain, brought together, and locked into position with oval pins. A U-shaped key pin, inserted in the oval pins, locks the assembly. → (58)



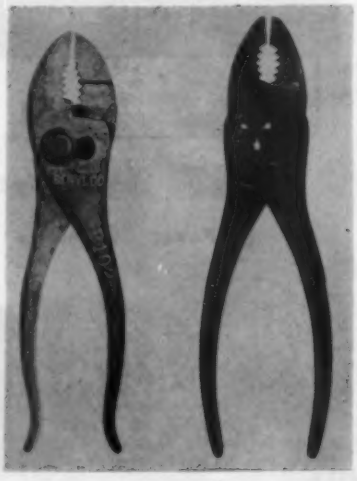
● A compact, low clearance Krawloader for use on the John Deere 40-C 5-roller tractor is now being made by Henderson Manufacturing Company, Inc. Designed for better service in both the industrial and farm fields, the Krawloader features a rugged box-section main frame, double-section cylinders with V-packing and chromed rods, a powerful front mounted hydraulic pump, auxiliary relief valve, oil filter and control valves. A reinforced self-leveling bucket cradles the load. ← (59)

● The new Caterpillar DW21 (Series C) tractor with a No. 470 scraper features a redesigned diesel engine rated at 300 hp. at 1800 rpm. The scraper is wider and longer and has the new lowbowl design for easier and more economical loading of materials. Redesigned into the diesel engine are a number of features including a new block, crankshaft, connecting rods, pistons and head. A more accurate valve train permits better engine operation with fewer adjustments. ↑ (60)

● A new and improved Huber-Warco Maintainer featuring a torque converter and power sliding moldboard is being made available by the Huber-Warco Company. As on old models, the new Maintainer features blade-pushing design of the moldboard, producing more work because power is transmitted directly from the drive wheel. The hydraulic torque converter automatically balances the torque of the engine to the load demand, preventing shock-loads and prolonging engine life. ↓ (61)



● Six and eight in. combination slip joint pliers (P-102 and P-103), have been added to the Beryloc line of spark-resistant safety tools manufactured by the Beryllium Corporation. The new, slimmer pliers are part of a series of forged tools and are nearly equivalent to alloy steel pliers in strength. The safety tools also will not chip or mash. → (62)



Shovel-Crane owners!

Working a hard 8 hour day... getting only 6½ hrs. output?

Operator fatigue can cost you important money. Here's how to minimize it!

THINK about the job you're working now. How much *more* money could you make if operators—good as they are—suffered little if any end-of-the-shift-letdown . . . never had to climb out and unlimber "cramping" arm and leg muscles?

Fingertip-operated Link-Belt Speeder power hydraulic controls minimize fatigue

With Speed-o-Matic—the true power hydraulic control system—shovel-crane response is fast, positive, easy. So easy that operators are actually "eager" to push the rig to its limit—all shift long! And what a limit!

You've never seen any machine that can compare with a Link-Belt Speeder for cat-quick agility and long-lived, bulldog stamina. Report after report shows these rigs account for up to 25% or more output per shift.

Seeing is believing

The precision construction, the quality materials and the advanced engineering that have gone into today's Link-Belt Speeder speak for themselves. All we ask you to do is see your distributor and judge for yourself. Be as critical as you like! No shovel-crane on the market today—crawler or rubber-tired, ½ to 3-yd, 8 to 60-ton capacity—can compare. Visit your distributor today or write for literature—LINK-BELT SPEEDER CORPORATION, CEDAR RAPIDS, IOWA.

13,980

LINK-BELT SPEEDER

Builders of a complete line of crawler and rubber-tired shovel-cranes.

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IN EVERYTHING RELATING TO DIAMOND CORE DRILLING AND SOIL SAMPLING

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For either core drilling or any other type of diamond drilling, we believe these to be the most efficient and economical diamond bits ever produced and invite inquiries on that basis. Available at no advance in price in a wide variety of types and sizes to meet every diamond drilling requirement. Bulletin No. 320 illustrates all types and gives complete working data. Write for free copy and tell us about your drilling conditions. We welcome opportunities to make money-saving recommendations.

NEW LIGHT-WEIGHT HIGH SPEED CORE-DRILLING MACHINES

Model 30 and Model L-2

Supplementing our well-known heavy duty machines we now offer two light-weight high-speed core drilling machines suitable for either Skid, Trailer or Truck mounting. Both models can be powered either by gasoline or diesel engines and air or electric motors. Easily moved from one location to another, they can also be relied upon to produce good smooth cores rapidly at minimum expense. Complete information on request.

TRAILER MOUNTED

For easy portability without tying up a truck. Also complete truck-mounted units with 4-wheel drive.

ACCESSORY EQUIPMENT
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We manufacture a wide variety of accessory equipment for diamond drilling and soil sampling and carry all essential items in stock for prompt delivery. A NEW CATALOG, No. 400, not only illustrates and describes each item but also gives piece numbers and shipping weights. Write today for a free copy; it will help you to save time and money.

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For more than 70 years, Sprague & Henwood, Inc. has been a leader in the field of Contract Diamond Drilling and Soil Sampling. During this period our crews have completed thousands of contracts successfully, under every conceivable operating condition. Today, we have a large force of expert operators and an ample supply of modern equipment, so that we can undertake practically any job anywhere, on short notice. Inquiries for all types of contract drilling work are solicited — estimates submitted promptly.

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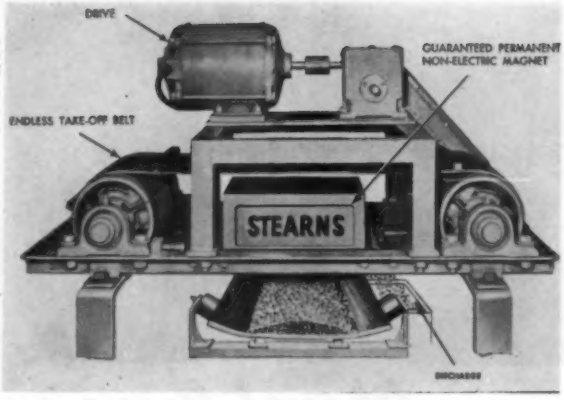
● Kansas City Hay Press Company's most recent development in sand and gravel pumps, the Model RU, is rubber-lined with only three wearing parts. Designed primarily for handling silica sand, glass sand, coal silt and other abrasive slurry, the rubber lining outlasts hard, alloyed metals many times. ← (63)

● Stearns Magnetic, Inc., Milwaukee manufacturer of Electro and Permanent Magnetic Separation and Transmission Equipment, has introduced a new line of "Discardo" Cross-belt Magnetic Separators that remove tramp iron and automatically discharge it from the flow of material in a continuous operation. → (64)



● Pioneer Engineering Works, Inc., makers of crushing and screening plants, have announced their latest model plant which features great adaptability and smooth operation. Designed for use in the intermediate crushing stage, the new 120 JS consists of a 4 ft. by 8 ft. 2-deck vibrating screen mounted ahead of a 2036 jaw crusher, with two delivery conveyors. Conversion of the 2036 jaw into the 1536 size is also possible by the use of a 5 in. spacer, an optional item. ← (65)

● Four-wheeled hydraulic brakes, previously available only on larger machines in the line, are now standard equipment on the Michigan Model 75A Tractor Shovel manufactured by the Construction Machinery Division of the Clark Equipment Company. → (66)

240-acre quarry

proves rubber-tired tractor ideal for scattered work

Unit's 19 mph speeds cut wasted travel time by over 50%

▲ Multi-disc air brakes totaling 2822 sq. in. braking surface give operator confidence to work fast close to edge of dump.

▲ Instant-shift, plus 8 mph reverse, enables tractor to clean around shovel without delaying load cycles.

Stone does little damage to tires...tires do ▼ no damage to tracks or pavement.

Five major tractor assignments face Columbia Quarry Company at their 240-acre limestone quarry near Columbia, Illinois.

1. Clean-up around a 6-yard production shovel (which loads 1,250,000 tons of rock yearly)...
2. Clean-up around two 3½-yard overburden stripping shovels...
3. Maintaining an overburden dump...
4. Maintaining a waste-rock dump...and
5. Maintaining at least 2 of the company's 15 crushed stone stockpiles each day.

These jobs, located from ½ to 1 mile apart, are handled efficiently with only *one* tractor — a high-speed Tournatractor!

This big 208 hp rubber-tired unit drives *everywhere under its own power* — on job-to-job moves, it often reaches 19 mph. Time studies show it *averages* 13 mph. This average speed is more than twice as fast as the *top* speed of a crawler-tractor formerly used on this work. Says Superintendent E. A. Heise, "We like this movability! Tournatractor sure gets around fast from one spot to another."

Dozes 180 loads hourly

On the job, this same speed helps Tournatractor equal or better output records of crawlers. Cleaning the edge of the overburden dump, for example, Tournatractor regularly pushes a bladeful of truck-dumped rock and clay over the edge every 20 seconds. Push forward usually takes about 12 seconds...change to reverse gear, ½ second...return, 8 seconds. Each pass moves up to 2½ bank yards.

Tournatractor also has proved ideal for clean-up around the rock shovel. Rig is maneuverable and fast enough to do the work without interfering with the shovel cycle. On clean-up after shooting, it moves in fast and reduces lost waiting time to minimum.

1/3 the lubricating time

Columbia Quarry also report they save time on maintenance, too. It takes Operator Vern Kremmel just 15 minutes a day to lubricate the Tournatractor, compared to 45 minutes a day to lubricate a crawler-tractor. He says, "Tournatractor is *easy* to oil and grease. You don't have to get down into the mud to do any of the work, so you don't get nearly as dirty."

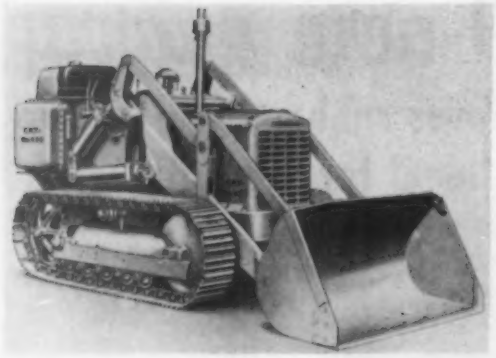
Why not investigate the high speeds, greater mobility, and lower maintenance Tournatractor can give. Call us to arrange a demonstration. No obligation.

Tournatractor—Trademark Reg. U.S. Pat. Off. T-786-Q-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company



● Newest tractor-shovel in Caterpillar's line of Traxcavators is the one cu. yd. capacity. No. 933. Designed and built as a single unit, No. 933 features all of the advantages of the heavier Model No. 955. A 40 degree bucket tilt-back, good power-to-weight ratio, and an advanced hydraulic system, are prime improvements. ← (67)

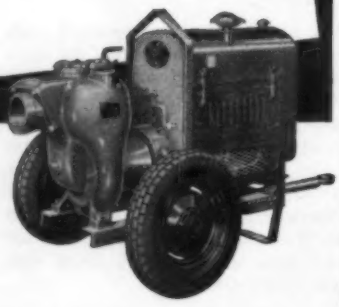
● Tornado Impact Crushers, manufactured by the Adams Engineering Company and distributed by Werco Steel Company, provide high efficiency while being low in cost. With only one moving part, the Tornado gives a sq. in. impact up to 70 t.p.h., with the 4½ ft. model, using a 40 hp. motor. For operations requiring 15 t.p.h. only a 10 or 15 hp. motor is necessary. ↑ (68)

Ever read a guarantee to beat this?

The Gorman-Rupp Guarantee

Our distributors are authorized to put a Gorman-Rupp Contractors' Pump on any pumping job, any time, anywhere, alongside any other make pump, size for size. The Gorman-Rupp Pump is guaranteed to pump more dirty water more hours, using less gasoline and to prime quicker than any other self-priming pump. If it isn't the best all-around pump, our distributor will accept the return of the Gorman-Rupp Pump and pay the user any installation expense incurred.

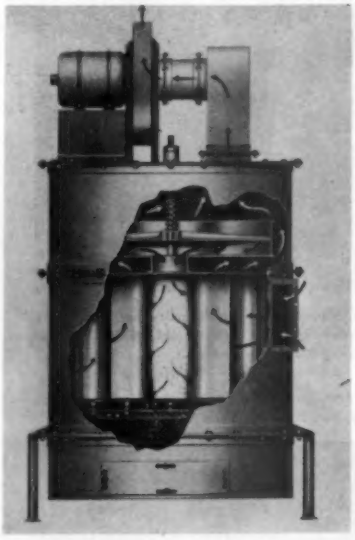
The Gorman-Rupp Company
Mansfield, Ohio



Sizes: 1½", 2", 3", 4", 6", 8", 10". Every pump covered by this plain-language guarantee!

Gorman-Rupp PUMPS

THE GORMAN-RUPP COMPANY
305 Bowman St., Mansfield, Ohio



● Cutaway view of the Day Company's new RJ dust filter depicts dust laden air entering inlet (right) as air travels through felted filter media depositing dust on filter sleeve. Surge of air from indexing collar and drum forces dust from sleeve (center). Clean air is carried back into circulation through exhaust fan located at top of the filter. The Day RJ filter efficiently handles air volumes up to 1200 CFM. For longer, maintenance free life, all moving parts are located on the clean air side of the filter media. ← (69)

How wide range of work keeps high-speed loader busy all year 'round

On this road-widening job, surplus materials are loaded from windrow into truck in a matter of seconds. No traffic interference.

Here is a heavy-duty, self-propelled, belt-type loader having a wide range of applications for highway departments. It loads practically any type of loose material out of windrows or stockpiles. In addition to high loading capacity, it gets around fast from job-to-job.

Use Adams TraveLoader for picking up surplus material on road and street construction or reconstruction. Use it for loading materials out of borrow pits and stockpiles. TraveLoader works fast in dirt, sod, sand, gravel, crushed stone, slag, cinders, snow. It loads topsoil for landscaping with no prior preparation.

How it works

TraveLoader loads in any one of a wide range of 5 working speeds from 0.29 to 1.9; has 5 travel speeds from 3.90 to 26.7. The floating, revolving, screw-type feeder automatically adapts its speed to the load ahead and places a continuous flow of material on the conveyor-belt. Trucks can be loaded with loose materials at up to 10 yards per minute. Travel speed range makes it easy to keep TraveLoader working to capacity. Trucks load behind loader, do not interfere with passing traffic. Moves job-to-job over highways and city streets at speeds to 26.7 mph.

Heavy, durable construction

All-welded, box-construction, one-piece frame extends full length of machine. Heavy-duty front and rear axles, sturdy feeder mechanism, rigid conveyor with sealed-for-life roller bearings, give TraveLoader the necessary strength to handle heavy loads at fast speeds with minimum downtime and maintenance. *Available with gasoline or diesel engines.*

Easy to operate

You will like TraveLoader's centrally-located control station . . . up out of the dust, permitting clear vision in all directions. Easy, fast, hydraulic controls, give quick adaptability to any working condition.

Get all the facts on the Adams TraveLoader from your LeTourneau-Westinghouse Distributor.

Side-shiftable cross conveyor (optional) loads trucks on either side of machine, assures proper balancing of load. A great time-saver in materials yards. Conveyor position power-controlled from operator's cab.

Cities have many uses for TraveLoader. For instance, ice and snow on city streets can be loaded at the rate of 12 to 20 yards per minute. TraveLoader finds work the year 'round.

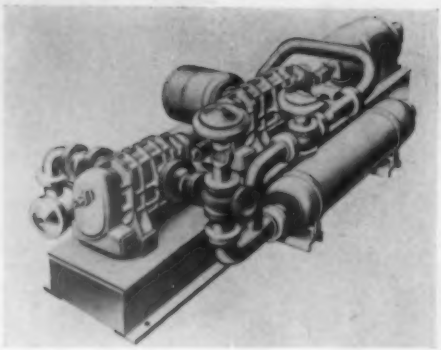
Here a contractor cuts and loads gravel out of a natural bank. Many contractors and highway departments use TraveLoader for loading stockpiled materials of all kinds.

AL-5-G-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company



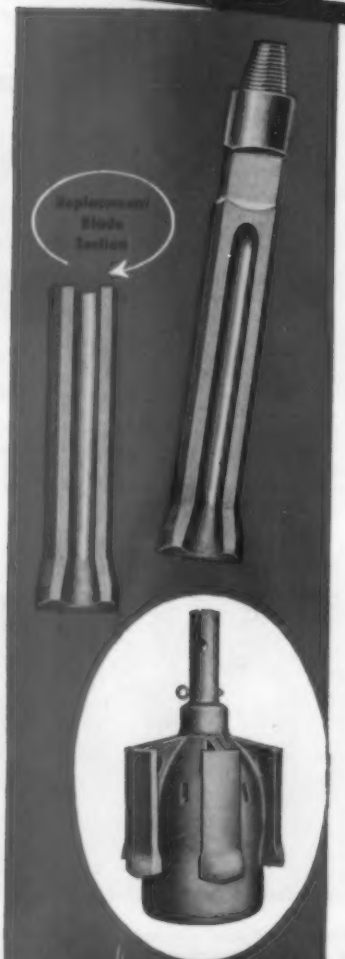
● A high-pressure, high-capacity compressor of air or other gases, the Standardaire is now being manufactured by the Read Standard Corporation. Intercooled, the Standardaire is available in capacities of from 100 to nearly 4,000 cu. ft. per minute, ranging from 15 to 600 hp. ← (70)

● Latest model in the line of heavy-duty tractor-mounted rock rippers is this unit made ATECO Earthmoving Equipment, designed specifically for Caterpillar D9 tractors. Weighing over 6½ tons, the ATECO HRD9 is built to match the D9's increased power and weight lift to handle heretofore "un-rippable" materials. ↑ (71)

SPANG

BLAST HOLE BITS

Drill More Holes Per Bit, At Less Cost Per Hole



SPANG CHURN DRILL BITS, famous for long life and economy in the drilling of blast holes for the fragmentation of minerals or overburden, drill *more-holes-per-bit* at *less-cost-per-hole,* because they are fully heat-treated from end to end and have the *extra strength in pin and blade sections* to stand up under the toughest drilling conditions. They are made with semi-dressed ends for quicker, easier finish-dressing, in High Carbon, A.I.S.I. 4340, and Spang Molloy Steel.

Available also, as an added economy, are SPANG REPLACEMENT BLADE SECTIONS in the same grades of steel, and uniform forge section, for welding to pin and collar sections of original bits when long service has worn the integral blade to a point where replacement is desirable.

Anyway you look at it, SPANG BITS are your best buy for more holes at less cost per hole.

SPANG REAMER TYPE PILOT BITS FOR DRILLING LARGE DIAMETER HOLES

Can be supplied in all sizes and in any practical weight.

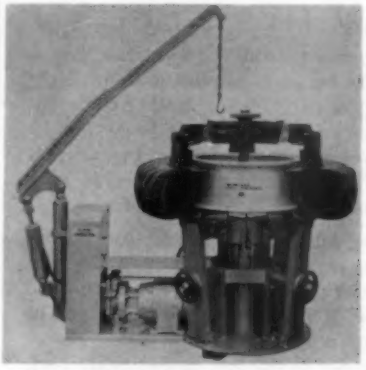
For information on SPANG BITS, and FREE CATALOG of Complete Line of SPANG Cable System Drilling and Fishing Tools, consult your nearest Dealer, or write direct to:

SPANG & COMPANY

DEPT. M-3 BUTLER, PENNSYLVANIA

The HIGHER STANDARD

For over 60 years Manufacturers of Spang Weldless Jars and a Complete Line of Cable System Drilling and Fishing Tools for Oil and Gas Wells, Water Wells, Prospect Drilling and Shot Blast Holes.



● A new Lock Ring Breaker is now available as an accessory for Salsbury Truck and Bus Tiremasters, a unit for mounting and dismounting all tires from 15 in. to 25 in. rim diameter, on flat base rims. The Lock Ring Bead Breaker enables both the top and the bottom beads to be broken without rehandling the tire. ↑ (72)

● The Aggregate Producers Handbook is just off the press. This entirely new, 124-page book will be distributed with the compliments of its publishers, the Smith Engineering Works of Milwaukee, Wis., manufacturers of Telsmith equipment for quarries, gravel plants and contractors. ↑ (73)

Above Rear-Dump handles 53% of limestone haul for Allegheny Mineral Corp.

The LeTourneau-Westinghouse machines you see here—a 186 hp Tournatractor and an 18-ton Rear-Dump—have been used by Allegheny Mineral Corporation, Cowansville, Pennsylvania, since the summer of 1953 both for stripping and for hauling shot limestone. Units work alternately at Allegheny's pits in Parker's Landing and Kittanning. They make trips between the two places under their own power. The Rear-Dump drives the 35 miles through traffic in about an hour; Tournatractor makes the trip in about two hours. Fingertip electric power steer and 4-wheel air brakes (more braking surface on 1 wheel than most units have on all 4) make for safe high-speed travel.

Above Rear-Dump is being loaded by a 1½-yd. shovel. Loads in the shot limestone usually weigh out at around 19 tons each. Note simplicity of the Rear-Dump body design. Unit has no frame, no sub-frame, no springs or spring hangers, no front steering wheels, no hydraulics . . . hence seldom needs repairs.

Low entry from rear, plus big 9½' x 12' target, speed loading . . . reduce spillage. Triple-layered all-steel body absorbs shocks of heavy, sharply-fragmented rock. High all-steel front guard protects driver, controls. Capacity of this Rear-Dump, without sideboards, is 18 tons. Other models carry 9, 35, and 50 tons.

Hauling shot limestone 4/10 mile from pit to crusher, Rear-Dump reaches 15 mph speeds, despite narrow roads, short sections of 10 to 15% grades and several sharp curves. Tires give adequate traction even on snow and ice. Material being hauled will be crushed into agricultural limestone and road-surfacing.

Waste material is dumped about half a mile from the shovel. Company records show Rear-Dump averages 34 loads per 8-hour shift—as much as the shovel can load. Note how body swings below and behind rear wheels. This keeps material from piling under unit, also allows safe dump over steep banks.

Spoil dumped by the LeTourneau-Westinghouse Rear-Dump and another hauler is leveled by Tournatractor. Other duties for this 19 mph tractor include leveling and maintaining limestone aggregate stockpiles, pulling a 15-yd. scraper to self-load and strip dirt and rock, and pulling a ripper to loosen rocky material.

Tournatractor blade carries 2½ cu. yds. per push. Electric-control down-pressure provides smooth cut. Tires roll without damage over abrasive footing which badly damages crawler tracks. Says Co-Owner C. H. Snyder, "LeTourneau-Westinghouse units just fit our layout. Their maintenance is low and production high."

Tournatractor—Trademark TR-662-Q-b

For more information on either Rear-Dump or Tournatractor, please write or call:

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

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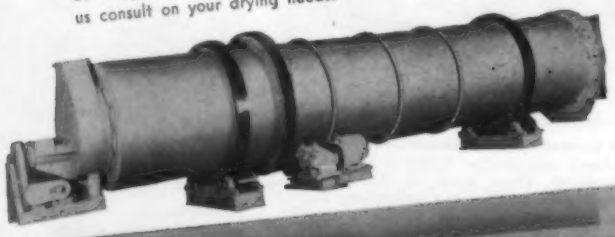
PATTERSON Rotary Dryers give you uniform drying of materials with continuous feed and discharge, exact control of temperatures, and excellent operating economy. Let us consult on your drying needs.



The Patterson Foundry and Machine Company

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NEW YORK, BOSTON, BALTIMORE, PHILADELPHIA, PITTSBURGH, DETROIT, CINCINNATI, CHICAGO, ST. LOUIS, HOUSTON, DENVER, LOS ANGELES, SAN FRANCISCO, SEATTLE

The Patterson Foundry and Machine Company, (Canada) Limited

Toronto, Canada

P & Q product briefs

(use reply card for more information)

AIR FILTRATION equipment manufactured by the *Wheelabrator Corp.* has been released which makes its possible to clean atmosphere more cheaply. The system employs conventional industrial Wheelabrator Dustube dust collectors of the tubular cloth filter type. This booklet gives full particulars. **Circle No. 74**

•

HUMBOLDT HIGH-DUTY TUBE MILLS, designed and manufactured by *Klockner-Humboldt-Deutz Ag,* of Germany, are pneumatically powered with installed separators, featuring a capacity, up to 50,000 kgs. per hour, small power requirements, uniformity of product, simple and rapid regulation, and efficient drying of moist material. **Circle No. 75**

•

QUARRY CARS, one of 20 industrial models manufactured by the *United States Steel Corporation,* are the pan type, with side dumpers, and a capacity of 231 cu. ft., or 20,000 lb. The body is pivoted on three steel rocker castings on each side while the car is equipped with air brakes. It operates on 3 ft. 0 in. guage track. **Circle No. 76**

•

TURBODIESELS, which utilize normally wasted energy of exhaust gases, manufactured by *Cummins Engine Company, Inc.,* are equipped with a turbocharger, developing additional hp. within the engine, permitting greater fuel savings, more power without increased size, and reduced engine weight per hp. **Circle No. 77**

•

WET REAGENT FEEDER Model 12A, designed by *Deco Flotation Engineers* and distributed by the Denver Equipment Company, with a capacity of 1500 c.c to 2250 c.c feeding rate, also feature greater accuracy, a new drip trough, stainless steel float valve, trough adjustment indicator, constant speed drive, uniform feed rate, and acidproof construction. **Circle No. 78**

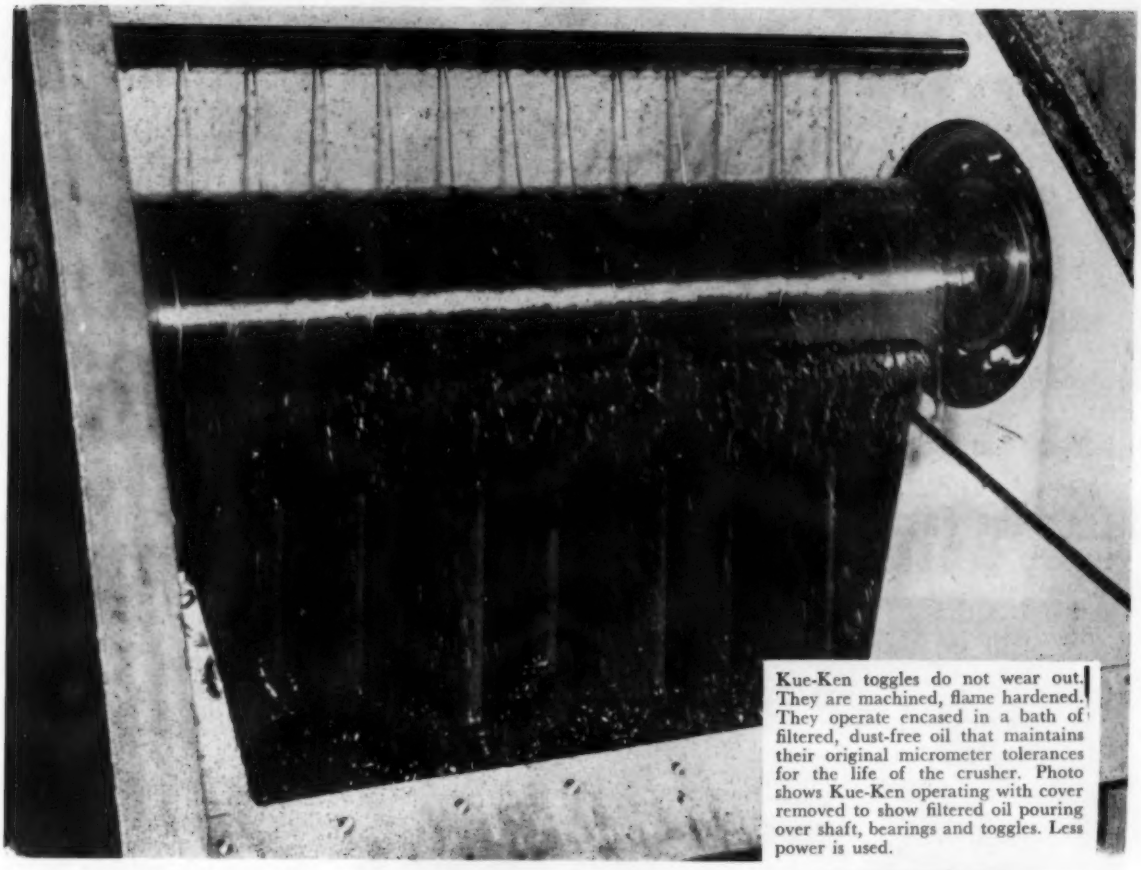
•

Tachographs, recording speedometers for trucks, made by the *Wagner Electric Corporation,* automatically record when the truck was started, how fast it traveled, when it was in motion, when it stopped, how long it idles, and the distance between stops. These facts aid in closer driver supervision, making drivers safety-conscious. **Circle No. 79**

•

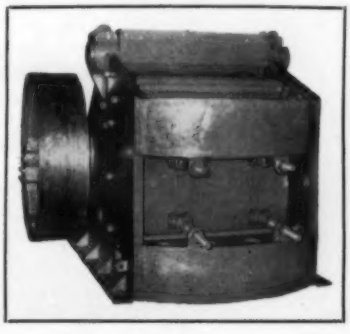
New Standard performance rated motors are the subject of a new data book published by the *Century Electric Company.* The new line of smaller electric motors, from 1 to 30 hp. are said to out-perform the larger, heavier Old Standard models. Trim and compact, New Standards are new in design and composition. **Circle No. 80**

Self-Lubricating Kue-Ken Crusher seals out maintenance costs



Kue-Ken toggles do not wear out. They are machined, flame hardened. They operate encased in a bath of filtered, dust-free oil that maintains their original micrometer tolerances for the life of the crusher. Photo shows Kue-Ken operating with cover removed to show filtered oil pouring over shaft, bearings and toggles. Less power is used.

Kue-Ken eliminates the shutdowns common to conventional crushers that are caused by rapid wear through dirt and grit in the operating mechanism. Kue-Ken is the only crusher with a crankcase-type lubrication system that is sealed against outside grit. All mechanism operates in a bath of clean, filtered oil. Higher speeds give greater capacity and more uniform product. In addition, "crushing without rubbing" gives 5 to 10 times longer jaw plate life. Overload cannot damage Kue-Ken . . . safety device instantly releases flywheel. No broken flywheels or bent shafts —no broken frames or toggles—no burned out belts or motors.



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KUE-KEN CRUSHERS

"LOWEST COST-PER-TON CRUSHING"

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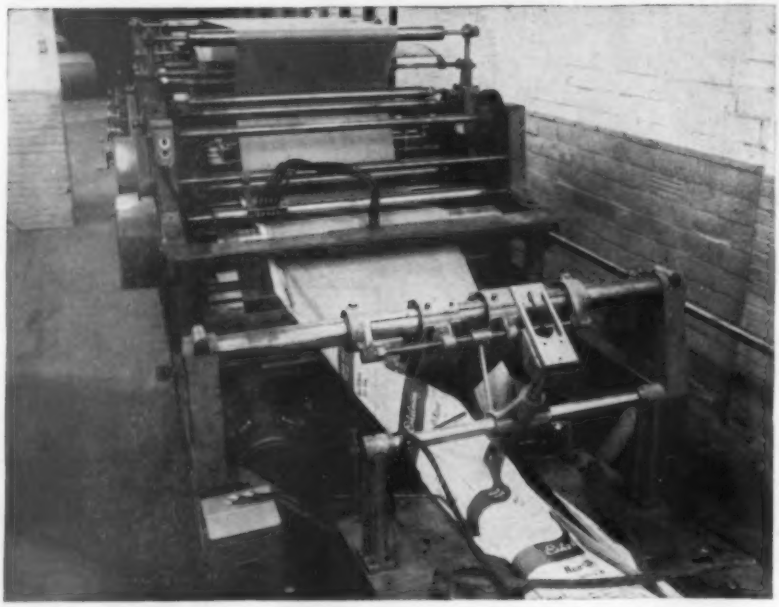
To Satisfy Demand . . .

Maybe you've heard it! Thomas Phillips is really on the move. Probably the fastest growing Paper Shipping Sack Manufacturer in the nation today. The big reasons: the desire to serve and the experience and equipment to deliver quality at competitive prices.

For example, the pictures on this page are the new Multiwall Tuber that will outperform any machine of its kind in the industry. Recently set into operation, it delivers extra fine quality tubes up to five walls of any type paper with unmatched speed, precision and accuracy.

It's all a part of a never ending search for better ways to produce better bags for industry and agriculture.

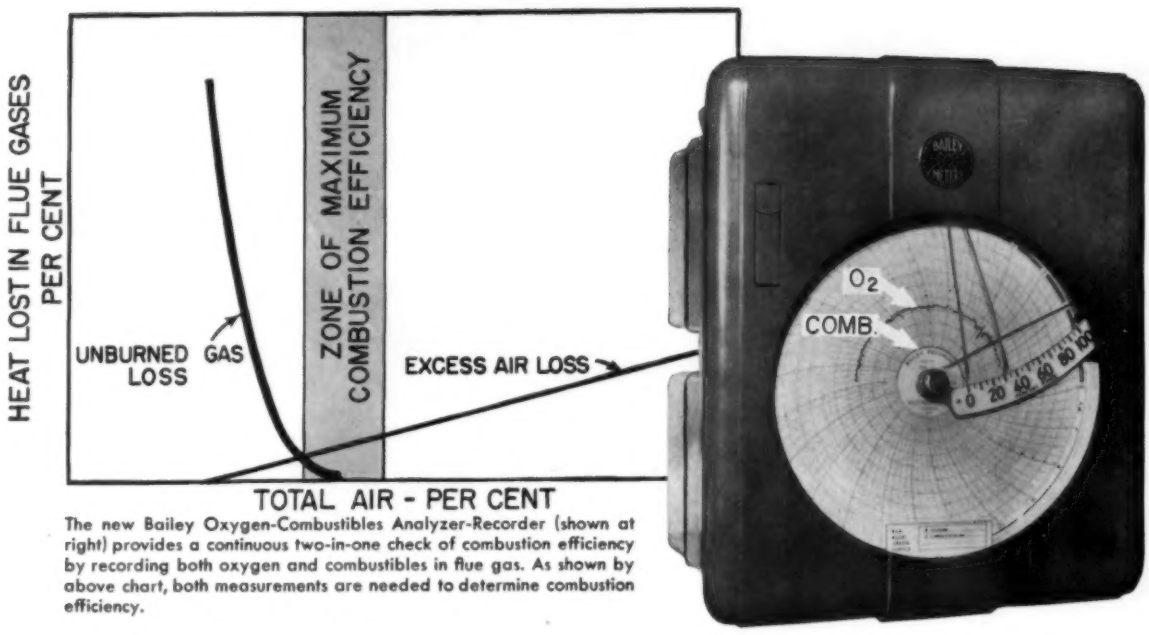
Here's the Fastest, Most Modern Multiwall Machine in Operation Today



Remember, too, Thomas Phillips is an integrated manufacturer exercising complete product control from pulp to paper to container.

A poor package is a liability from every standpoint. So why not get the finest — now that it costs no more. A trial car of Thomas Phillips shipping sacks, we're sure, will convince you that you should join our ever growing customer list.

The THOMAS PHILLIPS COMPANY
AKRON, OHIO



The new Bailey Oxygen-Combustibles Analyzer-Recorder (shown at right) provides a continuous two-in-one check of combustion efficiency by recording both oxygen and combustibles in flue gas. As shown by above chart, both measurements are needed to determine combustion efficiency.

BAILEY announces . . . New 2 in 1 way to measure Combustion Efficiency

The new Bailey Oxygen-Combustibles Analyzer-Recorder gives you a continuing double check on combustion economy. It's fast response measures and records:

1. Excess air—regardless of the fuel or combinations of fuels being burned.

2. The mixing efficiency of your fuel-burning equipment—by indicating the amount of combustibles in your flue gas, resulting from incomplete mixing of fuel and air.

Combustion efficiency depends upon fuel-air ratio. Too much fuel can be even more costly than too much air. And because of the interdependence of these two factors, no control that measures only one of them can give you complete protection.

Now, for the first time, you can check *both* with a *single* fast acting instrument, using the new Bailey Oxygen-Combustibles Analyzer-Recorder for industrial furnaces, kilns, heaters and boilers.

Fuel economy improves as excess air is reduced —until unburned fuel begins to show up in the flue gas. When this happens, combustion efficiency drops off sharply if there are further decreases in the air-fuel ratio. That's why combustion gases must be analyzed for *both* oxygen and combustibles to get a true indication of efficiency—and that is why Bailey coordinates both measurements on the same chart, to show when excess air may be reduced safely without danger of greater losses from unburned gases.

The Bailey Oxygen-Combustibles Analyzer is an approved combustion safeguard.

Ask your local Bailey engineer for suggestions on application. Equipment details in Product Specifications E65-1 and E12-5. P31-1

BAILEY METER COMPANY

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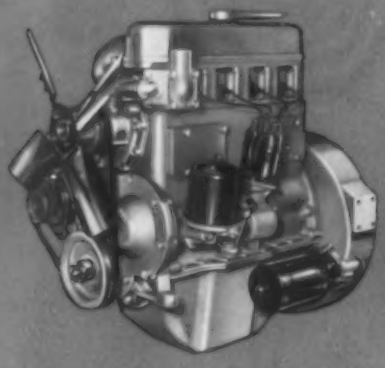
INSTRUMENTS AND CONTROLS

For Power And Process

HERCULES *announces*

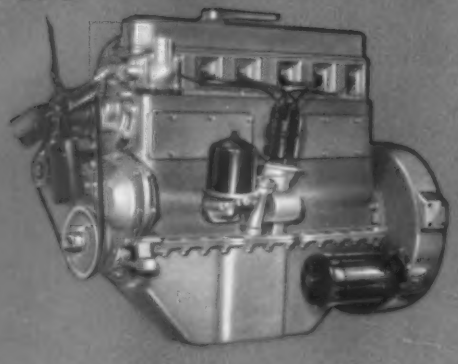
G. O. SERIES
GASOLINE OVERHEAD VALVES

G. O. 4



Model	Bore Stroke	Displ. Cu. In.	Max. H.P.
G.O. 173	3½"x4½"	173	67 @ 3200 R.P.M.
G.O. 198	3¾"x4½"	198	76 @ 3200 R.P.M.
G.O. 226	4" x4½"	226	87 @ 3200 R.P.M.

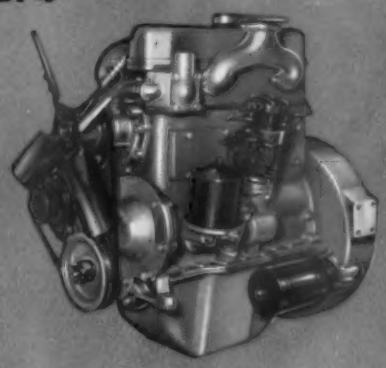
G. O. 6



Model	Bore Stroke	Displ. Cu. In.	Max. H.P.
G.O. 260	3½"x4½"	260	102 @ 3200 R.P.M.
G.O. 298	3¾"x4½"	298	114 @ 3200 R.P.M.
G.O. 339	4" x4½"	339	131 @ 3200 R.P.M.

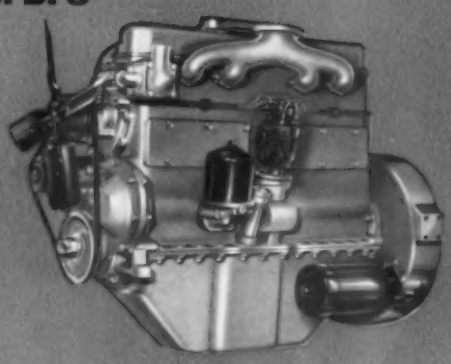
D. D. SERIES
DIRECT INJECTION DIESELS

D. D. 4



Model	Bore Stroke	Displ. Cu. In.	Max. H.P.
D.D. 173	3½"x4½"	173	50 @ 2000 R.P.M.
D.D. 198	3¾"x4½"	198	57 @ 2000 R.P.M.
D.D. 226	4" x4½"	226	65 @ 2000 R.P.M.

D. D. 6



Model	Bore Stroke	Displ. Cu. In.	Max. H.P.
D.D. 260	3½"x4½"	260	75 @ 2000 R.P.M.
D.D. 298	3¾"x4½"	298	85 @ 2000 R.P.M.
D.D. 339	4" x4½"	339	99 @ 2000 R.P.M.

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Construction

Material Handling

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MOUNTING DIMENSIONS

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NATURAL GAS

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MAJORITY OF PARTS

GASOLINE
L.P.G.
KEROSENE
NATURAL GAS

DIESEL

additions to the extensive line of HERCULES ENGINES

With the addition of these four new series consisting of 12 models, the Hercules Motors Corporation has increased its line of engine sizes and types to better serve the varied needs of the many different industries which require gasoline and diesel engines for their power requirements. This expansion of the Hercules line will enable manufacturers of end products to have a wider selection of engines and power units to meet individual requirements, all available from one dependable source.

Mounting dimensions of the new G.O. gasoline and D.D. diesel four cylinder engines are the same. The G.O. gasoline and D.D. diesel six cylinder engines are also interchangeable from the standpoint of mounting dimensions. Since this new series consists of parallel lines of gasoline and diesel engines, they can be used interchangeably, if desired, in any end product within the recommended engine speed ranges. Further, these engines can be built with manifolds and accessory equipment on either side, as the cylinder blocks are symmetrical and can be turned end for end.

Another important feature of these new models is the great number of parts which are interchangeable between the fours and sixes, and also, between the gasoline and diesel. This greatly simplifies the parts and service requirements. The only essential differences between these gasoline and diesel engines are cylinder heads, manifolds, pistons and fuel handling equipment.

Further information on the G.O. and D.D. series may be obtained by writing the factory.

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Road Building

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How to take the "Measure" of a nose-ring casting

Longer nose brick life, and longer continuous service, are big factors in evaluating a B&W nose-ring casting. In many cement, lime and dolomite plants, casting life has exceeded 9 years due to the following features.

WITH B&W NOSE-RING CASTINGS:

- **End of kiln shell is protected from the direct flame, and does not "feather down" from oxidation.**
- **Installation cost is low; B&W Castings are small and light in weight.**
- **Belling out of kiln shell is eliminated, resulting in longer brick life and longer continuous operation.**
- **Protecting flange on casting permits use of low-alloy steel bolts.**
- **Allowance is made for thermal expansion, removing one cause of belling.**
- **Four castings are used per foot of kiln diameter. Spare parts inventory may be kept low, as the same casting may be used on kilns varying up to two feet in diameter.**

Take advantage of these benfits in your plant. For further details on low-cost kiln maintenance with B&W Nose-Ring Castings, write to The Babcock & Wilcox Company, Process Equipment Department, Barberton, Ohio.

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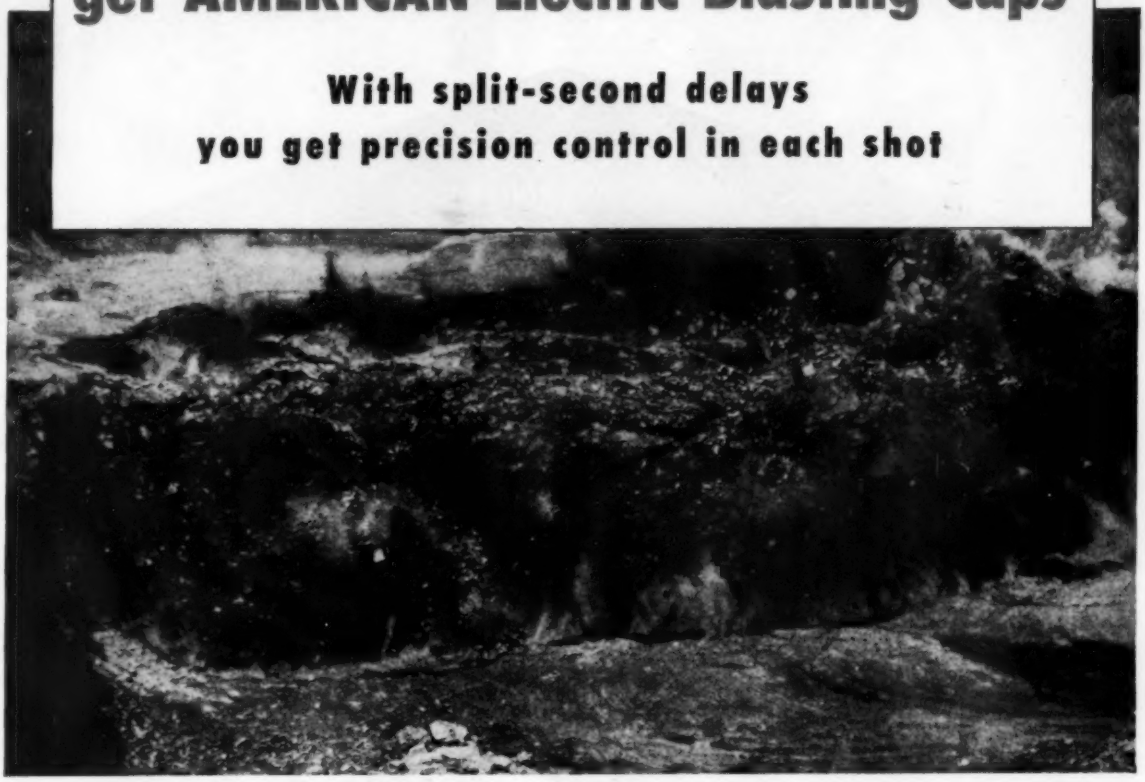
BOILER DIVISION

S-443

Get accurate timing...
get AMERICAN Electric Blasting Caps

With split-second delays
you get precision control in each shot



Produced for closest timing accuracy, AMERICAN Electric Blasting Caps reduce the chances of overlapping and cut-through to a minimum. Your shots go off when they're supposed to, in the sequence you want.

Check these other AMERICAN advantages too:

Strength to Spare – more than enough power to detonate most insensitive explosives

Five-Layer Insulation–uniform and rugged for highest electrical and mechanical strength

Added Waterproofing – time tested for full protection in the wettest holes

Wide Choice of Delay Periods–15 split-second delays for every blasting need

So for best results on every job, call your shot with AMERICAN. Magazines are conveniently located.

AMERICAN CYANAMID COMPANY
EXPLOSIVES

THE AMERICAN LINE:

High Explosives	Electric Blasting Caps
Permissibles	Instantaneous
Blasting Powder	Regular delay
Blasting Caps	Split-second delay

Blasting Accessories

If it's AMERICAN, it's dependable!

CYANAMID

AMERICAN CYANAMID COMPANY
EXPLOSIVES DEPARTMENT
30 Rockefeller Plaza, New York 20, N. Y.

Sales Offices: New York City, Latrobe, Pa., Pottsville, Pa., Scranton, Pa., St. Louis, Mo., Bluefield, W. Va.

SEE KENNEDY FIRST FOR

—any type equipment for the manufacture of

CEMENT, LIME, AGGREGATES

What some manufacturers class as "extras" are *standard* with KVS Machinery and Equipment... world-famous for low maintenance costs, peak capacity and dependable, economical operation under the most severe conditions.

We build a complete plant or a single machine to meet any requirement. Years of experience in successful installations, the world over, have established Kennedy Machinery as the *standard* of comparison. Research and progress *never stop* at KVS.

If you manufacture cement, lime, aggregates or process non-metallic minerals, KVS builds equipment designed to do a *better job*, at lower cost.

Engineering consultation available, anywhere, at any time. Before you specify, let KVS engineers help you select the equipment best suited to meet your requirements.

KENNEDY PRODUCTS

- Gyratory Crushers
- Swing Jaw Crushers
- Slugger Rolls
- Ball Mills
- Vibrating Screens
- Rock Feeders
- Air Swept Tube Mills
- Rotary Kilns
- Coolers, Dryers
- Preheaters, Deheaters
- Fans, Blowers
- Hoists, Conveyors
- Classifiers
- Pneumatic Transport Systems
- Dust Collectors
- Complete Cement Plants
- Complete Lime Plants
- Waste Heat Boilers
- Pulverized Coal Firing Systems

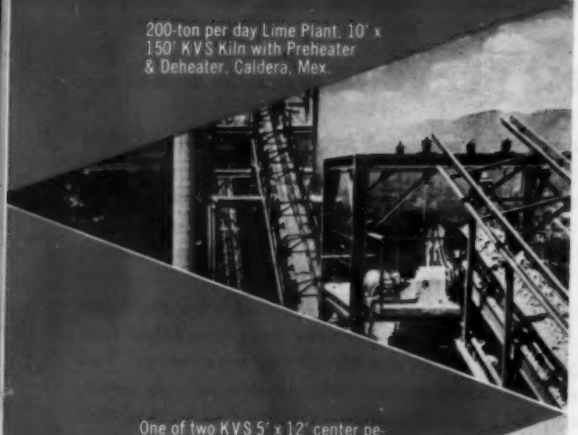
KENNEDY-VAN SAUN

MANUFACTURING & ENGINEERING CORPORATION

TWO PARK AVENUE, NEW YORK, N. Y. • FACTORY: DANVILLE, PA.

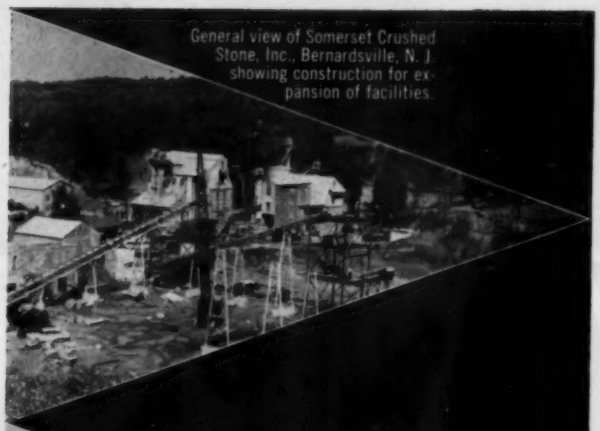
KVS Primary Crusher reducing lead zinc ore from mine run to 2⅞".

New Galite plant at Rockmart, Ga. of Georgia Lightweight Aggregate Co.

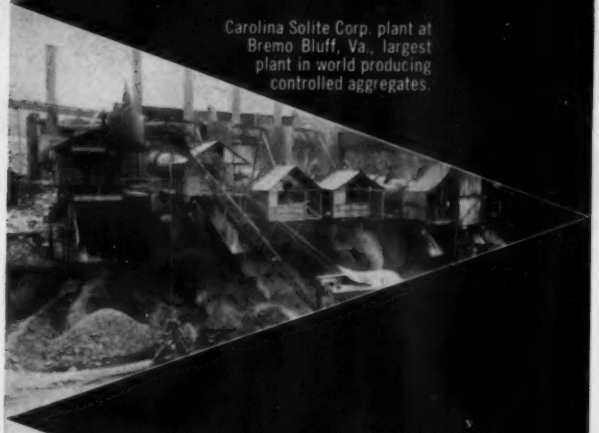


200-ton per day Lime Plant. 10' x 150' KVS Kiln with Preheater & Deheater. Caldera, Mex.

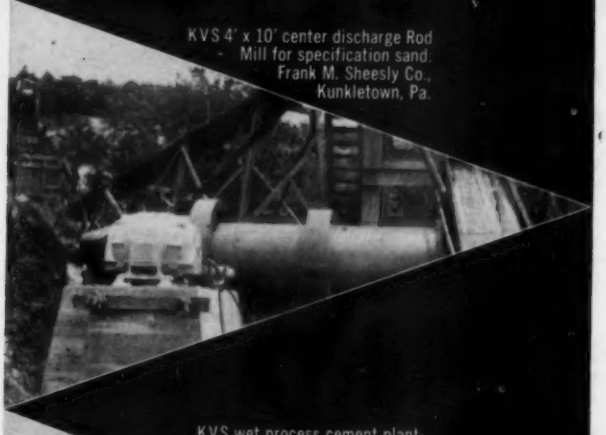
One of two KVS 5' x 12' center peripheral discharge Rod Mills, Refractory Sand Co., Andreas, Pa.



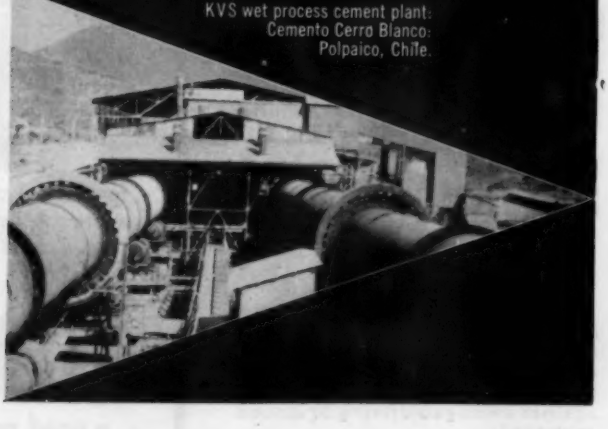
General view of Somerset Crushed Stone, Inc., Bernardsville, N. J. showing construction for expansion of facilities.



Carolina Solite Corp. plant at Bremo Bluff, Va., largest plant in world producing controlled aggregates.



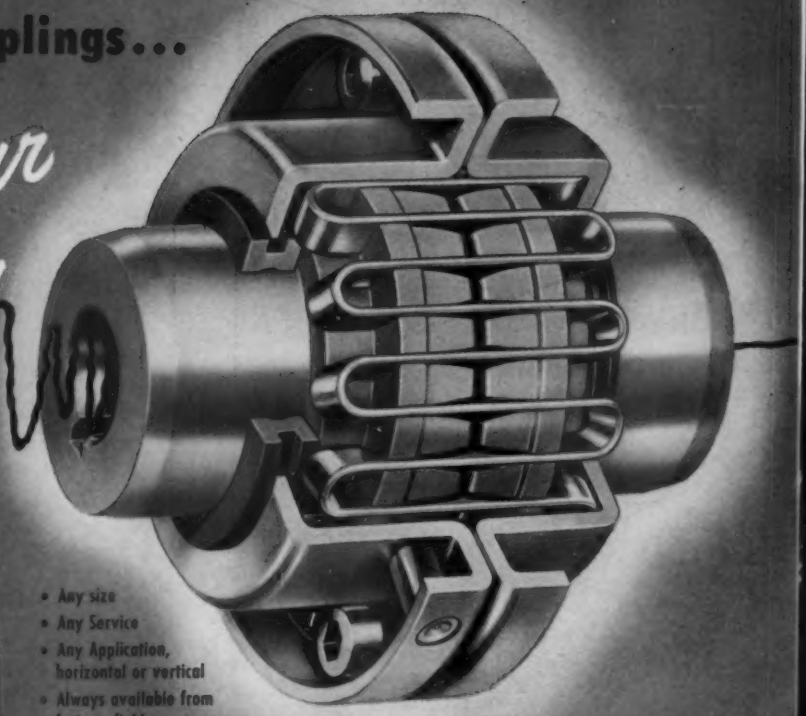
KVS 4' x 10' center discharge Rod Mill for specification sand. Frank M. Sheesly Co., Kunkletown, Pa.



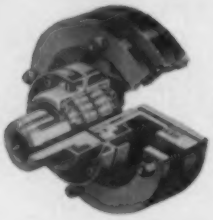
KVS wet process cement plant: Cemento Cerro Blanco: Polpaico, Chile.

Falk Steelflex Couplings...

Protect your machinery in 2 ways



- Any size
- Any Service
- Any Application, horizontal or vertical
- Always available from factory, field or distributor stocks

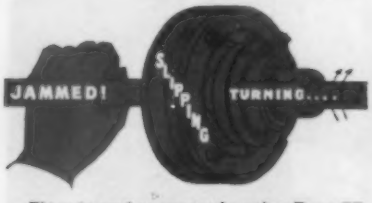


Falk Controlled Torque Couplings prevent damage from overloads

In applications where danger from overloads exists, use the FALK Type FT Controlled Torque Coupling. The Type FT has all the features and advantages of standard FALK Steelflex couplings—and, in addition, has an adjustable friction slip clutch, enabling the operator to set the coupling to slip at any predetermined overload.

This controlled-torque principle not only prevents transmission of dangerous shocks and limits overloads; it eliminates the breaking of shafts caused by jamming of driven equipment.

An outstanding advantage of the Type FT Coupling is that, as soon as the cause of the overload is removed, the entire coupling will rotate and transmit power without replacing parts or repairing coupling.



There's real economy in using Type FT Controlled Torque Couplings. Many users have reported that these couplings paid for themselves the very first time they slipped (under overload) because of the protection against damaged driving or driven machinery!

...cost less per year of service!

You get *double protection* when you connect your driving and driven machinery with a Falk Steelflex Coupling—the all-steel coupling with the exclusive grid-groove design! First, its *torsional resilience* smothers shock and vibration; and second, the Steelflex design prevents damage and lowered efficiency by accommodating shaft misalignment.

Why have increasing numbers of key men in industry standardized on Falk Steelflex Couplings? Their experience has proved that Falk Steelflex Couplings prolong the service life of their machinery... are trouble-free and need minimum maintenance... are easy to install, lubricate and disconnect... and *cost less per year of service* than ordinary couplings.

One basic Steelflex design—the type F, in its many sizes—is adaptable to more than 90% of all industrial applications. For applications involving danger from overloads, Modified Type FT Controlled Torque couplings (see column at left) are ideally suited. There are numerous other special or dual purpose Steelflex couplings for unusual applications. **Write to Department 247** for engineering bulletin, including selection and dimension tables.

THE FALK CORPORATION, MILWAUKEE, WISCONSIN

FALK

...a good name in industry

MANUFACTURERS OF:

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining

DRAMATICALLY SUPERIOR hot-zone service

with Kaiser Periclase-Chrome Brick

THESE FIGURES were furnished by cement producers during a field check of rotary cement kilns now using Kaiser Periclase-Chrome burned brick. Plants checked have a total capacity of nearly 27 million barrels.

This dramatically improved service is possible because Kaiser Brick is *especially designed* for hot zone linings to provide great volume stability under loading, high resistance to spalling and to chemical attack by cement clinker at higher temperature. Think what this means in shutdowns eliminated!

In addition, Kaiser Periclase-Chrome Brick takes a good coating in the kiln, usually without inducement.

If you are not yet using Kaiser Brick, let us show you *now* how its superior performance can give you increased clinker production at lower cost!

Plant	Average service Kaiser Brick	Average service 70% alumina Brick	EXTRA SERVICE with Kaiser Brick
1	14 months	1 month	13 months
2	24 months	12 months	12 months
3	15 months	3 months	12 months
4	15 months	4 months	11 months
5	14 months	3 months	11 months
6	14 months	3 months	11 months
7	12 months	4 months	8 months
8	15 months	7 months	8 months
9	7 months	1 month	6 months
10	12 months	6 months	6 months
			Average: 9.9 months EXTRA SERVICE

Call or write Kaiser Chemicals Division, *Kaiser Aluminum & Chemical Sales, Inc. Regional Sales Offices: 1924 Broadway,* OAKLAND *12, California... Three Gateway Center,* PITTSBURGH, *Pa.... 518 Calumet Bldg., 5231 Hohman Avenue, Hammond,* Indiana (CHICAGO).

Kaiser Chemicals

Pioneers in Modern Basic Refractories

Refractory Brick and Ramming Materials • Dolomite • Magnesia • Magnesite • Aluminas • Periclase

LOOK AT REO

"That's what it takes in a truck to keep rolling in our business"

...reports Hall Sand and Gravel, Inc., Denver, Colorado.

"We bought our first Reo in 1945, a used Dumper and it's still on the job. It proved to us that, dollar for dollar, there's no better truck to be bought.

"*Rugged strength* in a truck is a prime factor in our business, and Reo really has it. We wonder how they can take such punishment. No other truck has the guts that's built into these trucks.

"Our short-run stop-and-go hauling, requires more gear shifting than an over-the-road haul from Denver to Chicago. This is tough on a truck engine, and we've never had an engine failure in all the time we've been operating Reos."

Reo specializes in custom building heavy-duty trucks for tough jobs like those in the construction business. On or off-highway models with gas or LPG Gold Comet Engines—sixes or V-8's, from 107 to 220 h.p. Reo's advanced *short-stroke, wet-sleeve* Gold Comet engines are available in rugged Reo chassis or for replacement. *They are all backed by a 100,000 mile or 1 year warranty.*

THE HALL FLEET OF REOS delivers sand, gravel and concrete in the South Denver area. As much as 2,000 tons of sand and gravel and 338 yds. of concrete per day.

FOR "REAL GUTS!"

Hall's Reo "transit mix" model A630, 220 h.p., is equipped with a 6 yd. mixer (44,400 lbs. GVW). It saves 30 minutes per trip on a 20-mile run up an 8% grade, from Denver to Castle Rock. Rolls without laboring at 40 miles per hour on the highway.

REO MOTORS, INC.

LANSING 20, MICHIGAN • TORONTO, ONTARIO

SUBSIDIARY OF BOHN ALUMINUM AND BRASS CORPORATION

REO

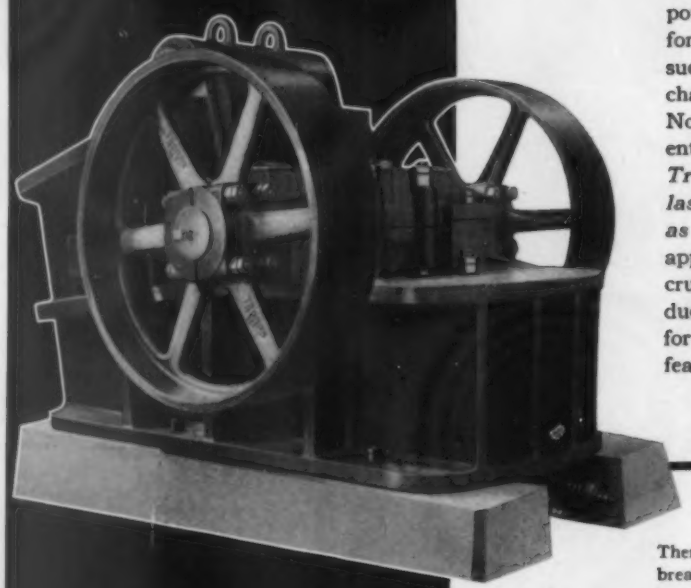
WORLD'S TOUGHEST TRUCK

TRUCKS, BUSES AND GOLD COMET ENGINES FOR ORIGINAL EQUIPMENT, INDUSTRIAL AND REPLACEMENT—GAS OR LPG

Traylor
JAW CRUSHERS

FOR HIGHER TONNAGE OF BETTER PRODUCT AT LOWER PRODUCTION COSTS

Check with the leading rock producers and chances are you'll find their profits start at a Traylor Jaw Crusher. For over half a century Traylor has been designing and building heavy-duty primary crushers that assure quarry-men greater hourly production, lower maintenance expense and reduced power costs. Traylor original non-chokable curved jaw plates apply power more efficiently as a direct crushing force. The increased capacity of each successive feeding zone in the crushing chamber eliminates choking and packing. Normal wear is evenly distributed over the entire face of the plate . . . *As a result Traylor curved jaw plates often outlast conventional plates by as much as 3 to 1.* Because of their more efficient application of crushing power, Traylor jaw crushers require less power per ton produced than any other jaw crushers. Send for bulletin which outlines all the famous features of Traylor Jaw Crushers.



There's a Traylor Jaw Crusher to fit every primary breaking requirement. Traylor builds four different types, each in a wide variety of sizes. Feed Openings range from 8" x 12" to 60" x 84"; capacities from 4 to 1000 tons per hours.

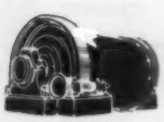
A Traylor leads to greater profits

Apron Feeders

Rotary Kilns

TRAYLOR ENGINEERING & MANUFACTURING CO.
807 MILL ST., ALLENTOWN, PA.
SALES OFFICES: New York • Chicago • San Francisco
CANADIAN MFR: Canadian Vickers, Ltd., Montreal, P. Q.

Primary Gyratory Crushers



Ball Mills

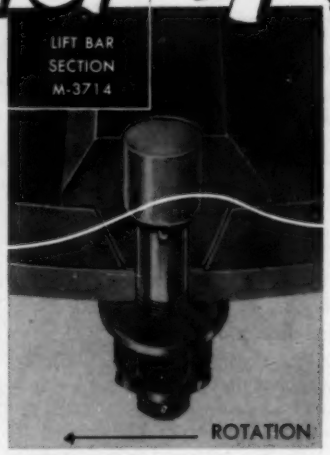
Jaw Crushers

Secondary Gyratory Crushers

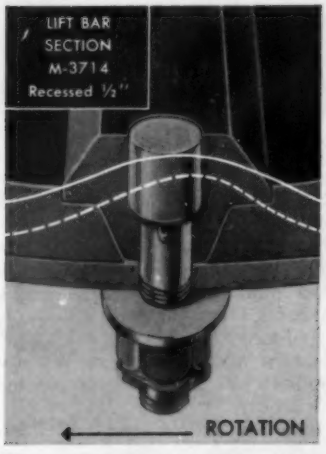
Four USS Lorain Rolled Plate Linings

better 4 ways...

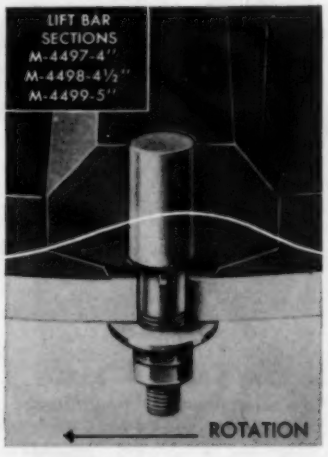
This type of low-cost lining is recommended for cement and soft grinding jobs. Plates are available in 1¼" and 1½" thicknesses. Bars are 6" wide—with 1⅝" lift. Ideal with balls up to 1¼" diameter. Line indicates maximum wear pattern.



Plates are available in 1½", 2", 2½" and 3" thicknesses. Bars are 7" wide—2½" lift. Designed for use with larger diameter balls up to 4". Line indicates maximum wear pattern.



Plates are available in 2", 2½" and 3" thicknesses. Bars are 7" wide. With the ½"-deep plate recesses, lift is 2". Because of the recessed design, bearing surface is retained permitting replacement of lift bars for extended service. Solid line indicates wear pattern with original bars. Dotted line indicates wear line of replacement bars.



Heavy duty linings and lift bars for toughest grinding assignments. Plates are available in 2", 2½" and 3" thicknesses. Bars are 8⅜" wide. Variable lifts from 1⅛" to 2½" are available. Line indicates maximum wear pattern.

These four important features of USS Lorain Rolled Plate Linings mean peak grinding efficiency . . . no matter what the grinding assignment. Compare them with *any* other liners on the market.

1. These are the only linings made of *hot rolled* steel. Our bars and plates are not castings, but are special hot worked steel, given superior toughness that eliminates breakage even when worn to paper thinness.

2. Lift bars are of rolled alloy steel with extra hardness and toughness that provides lift and better grinding efficiency throughout the life of the lining. For more severe service, bars are heat treated.

3. Lift bars and lining plates are made to exact dimensions for close tolerances that permit snug fit and eliminate shell wash—no zincing required.

4. Better design, better materials – they permit the use of thinner linings, thus increasing mill capacity.

Call on us for expert technical assistance on any grinding problem.

UNITED STATES STEEL CORPORATION, PITTSBURGH
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

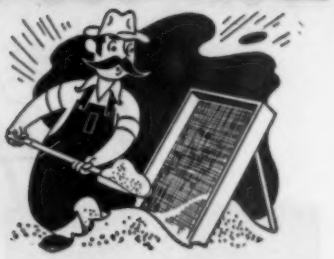
See The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

USS LORAIN ROLLED PLATE LININGS and USS GRINDING BALLS

S-2477

UNITED STATES STEEL

Screenings



by Ray L. Smith, Jr.

WHEN you get this issue of Screenings a New Year will be launched. Naturally, you want to make the most of it. You have made up your mind that you will do a *better* job than ever before. Of course, *"Better"* is a generality and means nothing until you break it down into specific, factual aims. For example, we might resolve to make this column *better* in 1956, but little progress could be made without a program of concrete steps to be taken, and even that would not be enough. Underneath every program must be a plan—we need to know not only *where* we are going but *how* we mean to get there.

Well, we *do* resolve to make Screenings better in this New Year. This improvement must continue month after month, for there is no satisfaction or progress in standing still. In fact, we do not believe that in any human activity it is possible to stand still. We either slip backward, or go forward.

To make this page better, we need your help. We invite both suggestions and criticisms — straight from the shoulder, for we are not thin-skinned. But, most of all, we need your contributions. We get a tremendous kick out of writing this department each month, but we know it has to please you too. So be a "talent scout" and send on anything you happen to see, that can be used in future issues.

Will you write to us—now—this week? And continue to do so, off and on throughout the entire year? In case you do not know it, the address is Ray L. Smith, Jr., 431 South Dearborn Street, Chicago 5, Illinois. Let's put our heads together. We are counting on you to do this. Don't disappoint us.

There Must Be A Harder Way

ITALIAN engineers have come up with a new recommendation for saving the leaning Tower of Pisa:

Take it apart stone by stone and then put it back together again, mounted on a deep concrete foundation.

If you're inclined to be despondent over the fact that the tower may fall at any moment, maybe *this* will cheer you up.

Injections of concrete periodically shot into the receding soil beneath the tower are believed to have saved it for at least another 100 years. That ends the subject as far as we're concerned.

Special Equipment

SHAPELY siren wears a Bikini swim suit that permits maximum sun on a maximum area as she gently carasses the lightweight hand winch (not wench) pictured. Yes look sharply, and you'll see there is a lightweight hand winch in the picture. No newcomers, but no less desirable to efficiency lovers, are those ever-able Beebe Bros., products.

Manufacturer advises that these lightweight jobs are offered in four models, designed to perform thous-

ands of miscellaneous operations afloat and ashore. That's okay with us, 'cause we've always leaned slightly toward special equipment.

Manufacturer also states that a two-way, spring-operated dog permits safe operation of these winches (not wenches). Can't see the dog, but then, who can get their minds on dogs at a time like this.

Potpourri and Succotash

. . . many a man who married a woman because she owned a home and a car has found to his sorrow that it would have been cheaper to rent a room and ride the bus.

Among the many Christmas cards received this week, was the following little gem, sent in by one of our west-coast friends.

I'm sending this card just to tell you
That taxes have taken away
The things that I really have needed,
My workshop, my reindeer, my sleigh.
I'm making my rounds on a donkey,
He's old, he's crippled, he's slow,
So you'll know if you don't see me Xmas,
I'll be out on my donkey in the snow.

Apparently it was thought we'd treasure the item, but we're really much more beguiled by a question which the *"donkey"* in the last line leaves unanswered.

Would he really be out on his donkey in the snow? Don't tell us, now! We want to work it out for ourselves.

A famous hunter finally decided that his 15-year-old son was old enough to accompany him on a hunting trip and so informed his eager offspring.

En route to the hunting site the hunter kept stressing the fact that a good hunter never returns empty handed. They camped in an old abandoned log cabin and bright and early the next morning the boy was handed a rifle and told to go out and bag a bear.

The boy hadn't gone but a few hundred yards into the woods when he encountered a huge bear. He sent shot after shot whizzing harmlessly by the beast and in panic the lad dropped his gun and took off at high speed toward the cabin with the bear at his heels.

Remembering what his father had said about returning empty-handed he thought fast and as he fled through the cabin he yelled at his startled father: "Okay, Dad, you skin this one while I go out and get another one!"

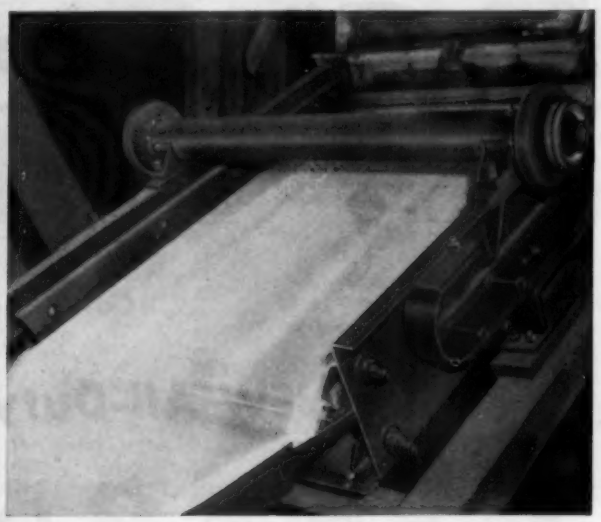
Choose a LINK-BELT Vibrating Screen
for your screening job

Sizing, Scalping, Dewatering, Rinsing . . . at LOW COST

Link-Belt "CA" Vibrating Screen and non-clogging spray nozzles are combined for efficient washing and sizing.

For high-capacity screening of a broad range of materials—Link-Belt "CA" Vibrating Screens are your answer. Concentric Action of vibrator mechanism imparts positive, uniform, circular motion to every square inch of the screening surface. Centrifugally-actuated, unbalanced weights reduce vibration of accelerating and decelerating—are easily adjusted to the amplitude of highest screening efficiency. What's more, lively vibrating action achieves bed stratification *fast*—assures accurate sizing, thorough rinsing, rapid dewatering. Made in a complete range of sizes to suit all plant capacity requirements—single, double or triple decked.

Call your nearest Link-Belt office or write for new Book 2554.



Here fine silica sand is effectively sized by a double-deck Link-Belt "UP" Unbalanced Pulley type vibrating screen.

For economical separation of light to medium weight materials—choose Link-Belt "UP" Vibrating Screens. Positive, high-frequency action over entire area of cloth provides maximum sizing opportunity for every particle. Even on the smallest cloth sizes, blinding is virtually eliminated. And you'll like the lower power and maintenance costs resulting from two-bearing simplicity. "UP" screens are available in open, semi-enclosed, or totally-enclosed types, single or multiple decks in a wide range of sizes.

Get complete information at your nearest Link-Belt office or by writing for Book 2377.

LINK-BELT

VIBRATING SCREENS

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 13,817

Visit our Booths 334-342—National Sand & Gravel Assn., Coliseum, Chicago, February 13-16

Cuts costs WHEREVER it's put to work!

LOGGING

CONSTRUCTION

MINING

The NEW All-Duty

GENERAL L.C.M.

with Stronger-than-Steel NYGEN® CORD

- **MAX-TRACTION**—No other tire so nearly approaches ideal crawler-like flotation and traction as this rugged new General L. C. M., greatest ever developed by tire engineers.
- **ALL-DUTY**—The opened-up tread of the new L.C.M. makes it truly an all-duty tire for all type operations. Reduces rolling resistance . . . increases tread life.
- **NYGEN CORD**—The new all-duty L. C. M. is built with stronger-than-steel Nygen Cord, *exclusive* with General. Nygen provides utmost protection against breaks and growth.
- **EXTRA PROTECTION**—Wider, heavier tread with deep-drive cleats protects sidewalls against cuts and snags . . . puts more rubber on ground for less strain, less stress per-square-inch.

THE GENERAL TIRE & RUBBER CO.
AKRON, OHIO

Specify GENERAL Tires on your new equipment

Labor Developments

White Collar Exemptions

TO be exempt from the overtime provisions of the Federal Fair Labor Standards Law, executives and administrative and professional employees must meet certain tests set down by the Wage and Hour Administrator. Among them is a salary which, since 1949, required that exempt executives must earn at least $55 per week and administrative and professional employees must earn at least $75 per week.

Because of rapidly rising salary rates in recent years, the Wage and Hour Division of the U. S. Department of Labor is considering whether it should again raise these qualifying figures. In that connection, it has made and published a study of the income and earnings of white collar workers, the results of which will interest employees everywhere.

The first question they asked was, "By how much have the earnings of white collar workers increased?" The answers secured from a wide variety of surveys made by both government and private agencies showed remarkable unanimity.

1. The National Industrial Conference Board, Inc., a prominent privately supported economic research organization, reported the following percent increases in the median weekly salaries of clerical employees in 20 large cities:

Increase in Median Weekly Salaries April 1949 to October 1954

Occupation	April 1949 to October 1954 Percent
Billing machine operator	26
Bookkeeping machine operator	27
Calculating machine or comptometer operator	33
Dictating machine transcriber (senior)	32
Receptionist	36
Stenographer	33
Telephone switchboard operator	37
Typist (senior)	26

2. The U. S. Department of Labor's Bureau of Labor Statistics reported the following percent increases in the average weekly salaries of women office workers in 9 areas:

By S. HERBERT UNTERBERGER

S. Herbert Unterberger and Company
Economists-Consultants on Labor and Industrial Relations
Washington, D. C.—Philadelphia, Pa.

Precent Increase in Average Weekly Salaries, 1949 to 1955

Area	All Industries	Manufacturing Only
Atlanta	24	37
Boston	34	31
Chicago	34	33
Denver	32	39
Los Angeles	32	36
Milwaukee	32	36
New York	31	31
Philadelphia	32	33
San Francisco	24	25

The next question was, "By how much have the earnings of executive, administrative, and professional employees increased?" The answer was provided by two agencies.

1. U. S. Department of Commerce reported that the median income of salaried employees
   a. serving as managers, officials, and proprietors increased between 1949 and 1954 by 38 percent:
   b. engaged in professional, technical, and kindred work increased between 1949 and 1954 by 33 percent.

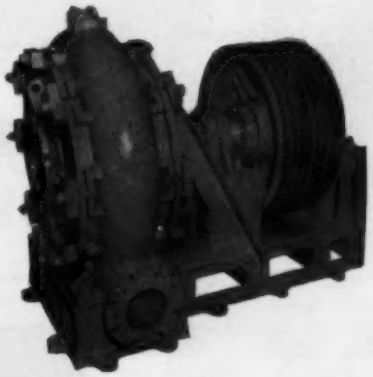
2. The Journal of College Placement stated that average starting salaries for inexperienced graduates increased as follows:

Increases in Starting Salaries, 1949 to 1955

Field	Percent
Engineering	38
Accounting	38
Sales	40
General business trainees	39
All fields	39

(*Continued on page* 86)

MECKUM *Material Handling Pumps*



★ Low initial & operating cost.

★ Engineered individually for hydraulic efficiency and simplicity of maintenance.

★ All wearing parts made of alloys to suit various types of materials pumped.

★ Ease of-assembly of replacement parts reduces shut down time.

Another progressively engineered product. In sizes from 4" to 30".

Also manufacturers and suppliers of complete dredges, pipe, fittings and equipment necessary to efficient production of materials. Write us for details or nearest installation.

SEE US AT THE NAT'L SAND & GRAVEL CONVENTION, BOOTH NO. 230

MECKUM ENGINEERING, INC.

53 W. Jackson Blvd., Chicago 4, Ill. Dayton Road, Ottawa, Ill.

Best way to make your contracts pay—

SPECIFY GM

in all your Construction Equipment

PRODUCTION UP 30%—FUEL COSTS CUT 30%

Arizona Sand & Rock Company replaced a 4-cycle Diesel with a 2-cycle GM Detroit Diesel on this pug mill. Despite clouds of dust, maintenance costs dropped 25%—and production control is better with fast-acting, 2-cycle Detroit Diesel power.

KEEP 600,000-YARD CONTRACT GOING

Marsolino Construction Co. relies on GM Detroit Diesel-powered Ingersoll-Rand Gyro-Flow compressors to keep this 600,000-yard contract moving. They report the Detroit Diesels "start easily—are dependable and economical."

CUTS FUEL COSTS 40%—UPS PRODUCTION 25%

When Miami's R. E. Vaughan, Inc. switched from a 4-cycle Diesel to a 2-cycle GM Detroit Diesel on this ditcher, production jumped 25%—fuel costs dropped 40%. They report the Detroit Diesel delivers more power at less cost, too.

TRAVELS 35 M.P.H. ON THE HIGHWAY

Speed like this *between* jobs means more time on the job for this GM Detroit Diesel-powered Warco grader operated by Michigan's Henry Schmid Sons. Company's Detroit Diesel-powered dragline has worked over 17,000 hours on $100 for repairs.

Name the construction equipment you need—and it's a sure bet that you can get it powered with a General Motors Detroit Diesel.

For more than 150 manufacturers offer GM Detroit Diesel power in over 1,000 different applications—*because it's America's first choice Diesel!* With their reputations riding on every piece of equipment they sell, it's certain these manufacturers pick the best Diesel available to power their products.

And when you specify a GM Detroit Diesel in your construction equipment you get a Diesel that costs less to buy, less to run, and less to maintain.

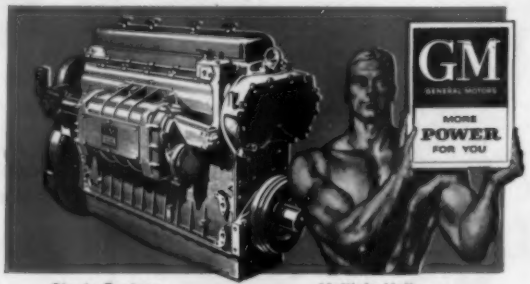
You get a Diesel that delivers more power from a smaller, lighter engine.

And you get a Diesel backed by a nationwide network of GM Detroit Diesel Distributors ready to give you fast service and quick delivery of low-cost parts *day or night.*

Your local GM Diesel Distributor or dealer can give you the list of equipment powered with GM Detroit Diesel engines. Call him today or write direct.

DETROIT DIESEL

Engine Division of General Motors, Detroit 28, Michigan



Single Engines... *30 to 300 H.P.*

Multiple Units... *Up to 893 H.P.*

AMERICA'S LARGEST

DETROIT DIESEL POWER

NO REPAIRS IN 10,000 HOURS

In 1951, Minnesota's Phelps-Drake Construction Company bought a GM Detroit Diesel-powered Lima Paymaster. And in 1953, they bought a second Paymaster plus a Wellpoint pump—both GM Detroit Diesel-powered. At last report none of the engines had any repairs, were still going strong after more than 10,000 hours. Phelps-Drake also reports production is high—fuel cost low—with Detroit Diesel power.

BUILDER OF DIESEL ENGINES

Labor Developments

(*From page 82*)

The above data suggest strongly that since 1949, when the present qualifying earnings for white collar exemptions were established, white collar earnings have increased by 30 to 40 percent. It would be no surprise, therefore, if the qualifying earnings were to be increased by about 35 percent, or to about $75 per week for executive employees and about $100 per week for administrative and professional employees.

Level of White Collar Earnings

The next question asked dealt with the actual level of salaries paid to executive administrative and professional employees. Here the data were relatively sparse. The best information came from two sources.

1. The American Management Association's Executive Compensation Survey showed the following average salaries for foremen in 1955:

Average Salaries of Foremen—1955

Industry Group and Salary	General Foremen	Production Foremen, Major Depts.	Other Production Foremen	Maintenance Foremen
Durable Goods Industries				
Average actual salary	$ 8,479	$7,416	$6,241	$6,822
Salary range				
Average minimum	7,087	6,090	5,220	5,706
Average maximum	9,982	8,380	7,316	7,854
Non-durable Goods Industries				
Average actual salary	8,000	6,856	5,783	6,716
Salary range				
Average minimum	7,100	5,806	4,670	5,490
Average maximum	10,000	8,324	6,625	7,857

2. The U. S. Department of Labor's Bureau of Labor Statistics reported the following data for draftsmen:

Average Weekly Earnings—1954-1955

Draftsmen, leader	$125
Draftsmen, senior	97
Draftsmen, junior	72

Executive and Professional

To secure information on the proportion of executive, administrative and professional employees at various salary levels, the Wage and Hour Division made its own survey and thereby secured a great deal of hitherto unavailable information. The two critical figures are probably the percents of establishments employing such employees at salaries below $100 and $75 per week.

	Firms Employing Executives at Less than $100 (Percent)	Firms Employing Executives at Less than $75 (Percent)
All establishments	36	10
By region:		
New England	39	12
Middle East	28	8
South	50	19
Midwest	33	7
Far West	29	4
By size of establishment:		
1-7 employees	36	11
8-19 employees	28	8
20-49 employees	30	8
50-199 employees	43	12
200 or more employees	64	20
By size of city (population):		
Under 2,500	49	18
2,500 to 10,000	44	15
10,000 to 100,000	40	11
100,000 or more	28	6
By industry:		
Manufacturing	38	11
Mining	28	8
Construction	19	4
Trade	33	9
Finance, insurance, real estate	36	7
Transportation and utilities	36	7
Services	39	14

Clearly, a qualifying figure as low as $75 per week would permit only a very small minority of firms to have virtually all of their executive employees exempt. Even a $100 per week figure would affect only a little more than one-third of the firms. It is not surprising to find that the regional breakdown shows that in the South 50 percent of the firms have executive employees paid less than $100 per week. It is far more surprising to discover that the breakdown by size of establishment shows that 64 percent of the largest firms, those with 200 or more employees, have executive employees who are paid less than $100 per week.

Turning to administrative and professional employees, the overall figures are not very different. Just about one-third of the firms have administrative employees paid $100 or less and about one-fourth of the firms have professional employees paid less than $100 a week. These data suggests that the different treatment for executive employees on the one hand and administrative and professional employees may not be fully warranted. This may foretell a move to bring the two figures closer together.

	Percent of Firms Hiring Administrative Employees at less than $100	Percent of Firms Hiring Professional Employees at less than $100
All establishments	33	24
By region:		
New England	40	30
Middle East	25	17
South	39	30
Midwest	34	27
Far West	34	20
By size of establishment:		
1-7 employees	34	16
8-19 employees	30	24
20-49 employees	29	18
50-199 employees	33	21
200 or more employees	48	34
By size of city (population):		
Under 2,500	38	26
2,500 to 10,000	35	27
10,000 to 100,000	38	28
100,000 or more	30	21
By industry:		
Manufacturing	32	23
Mining	15	27
Construction	19	16
Trade	33	13
Finance, insurance, real estate	51	29
Transportation and utilities	39	36
Services	34	36

Again, with respect to administrative and professional employees, the firms in the South and those with the largest number of employees will be least able to qualify the bulk of their employees in these categories for exemption from the Wage-Hour law.

All told, these data indicate clearly that a substantial rise in these minimum qualifying figures is "in the cards".

Foreman, Ark., Site Studied For $6,100,000 Cement Plant

Plans for building a proposed $6,100,000 cement plant at Foreman, Ark., have been announced by a group of 11 Texas businessmen.

The group is headed by R. J. Smith, J. Percival Rice, and R. J. Bowles, all of Dallas. Businessmen from Houston and Fort Worth are also participating in the project.

Construction of the plant on a 1,710-acre tract is expected to be completed about January, 1957. The plant will have a capacity of 2,500 bbl. of cement a day, or 876,000 bbl. per year. Kennedy-Van Saun Manufacturing & Engineering Corporation will build the plant and operate it for a three-year period.

At the Alabaster, Mich., plant of the United States Gypsum Company an over-water bucket conveyor system takes gypsum on a two-mile trip to ships anchored in Lake Huron.

announcing

Industrial Brownhoist rubber-tired diesel electric cranes

electric travel, electric rotation!
25 to 60 ton capacities!

Designed and built by Industrial Brownhoist Corporation for mines, quarries, railroads, steel mills, the lumber industry and other large manufacturing plants that require mobile materials handling equipment in heavy duty capacities, Brownhoist's first Diesel Electric Wagon Crane is now in production. Available in capacities from 25 to 60 tons, the new wagon crane will be equipped with dynamatic clutch, anti-friction bearings at essential points, and power steering. It employs electric travel and electric rotation. Mounted on a 12-wheel crane carrier capable of speeds up to 8 miles per hour, the unit can be operated by one man from easy-to-reach crane and carrier controls. Rigorous tests indicate that the new machine provides economical operation and insures added savings of time and labor in heavy duty materials handling work. For complete details, consult a Brownhoist representative or write us today.

BROWNHOIST MATERIALS HANDLING EQUIPMENT GIVES A LIFT TO AMERICAN INDUSTRY

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179-A

BROWNHOIST

FULLER PREHEATER
Humboldt Suspension Type

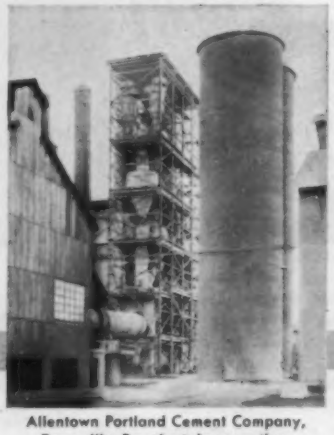
High Capacity With

...first of 13 to be installed

FULLER PREHEATERS INSTALLED* OR ON ORDER

COMPANY	LOCATION	NO. OF PREHEATERS
*Allentown Portland Cement Company	Evansville, Pa.	1
*Alpha Portland Cement Company	Cementon, N. Y.	1
*Lehigh Portland Cement Company	Fogelsville, Pa.	1
North American Cement Corporation	Hagerstown, Md.	1
Huron Portland Cement Company	Alpena, Mich.	2
Nazareth Cement Company	Nazareth, Pa.	1
Medusa Portland Cement Company	Dixon, Ill.	3
Ideal Cement Company	Boettcher, Colo.	2
Whitehall Cement Manufacturing Company	Cementon, Pa.	1

Lehigh Portland Cement Company, Fogelsville, Pa. plant. Photo taken during erection. Now in operation.



Allentown Portland Cement Company, Evansville, Pa. plant. In operation.

Alpha Portland Cement Company, Catskill plant, Cementon, N. Y. In operation.

Key§†	Starting Date	Kiln Capacity Before Preheater Bbl./Day	Kiln Capacity With Preheater Bbl./Day	B.t.u./Bbl. of Clinker Before Preheater	B.t.u./Bbl. of Clinker With Preheater	Temp. of Mat'l. From Preheater °F	Type Raw Material	Old or New Kiln	Kiln Size	Kiln Slope	Kiln Speed r.p.h.	% Capacity Increase	% Fuel Saving
1.	Nov. 1950	840	1200	995,000	661,000	1500°F	With 15-35% Slag	Old	8'-3" x 133'	½"	50	42.8%	33.3%
2.	April 1953	1250	1782	925,000	620,000	1238°F	Lime Marl	Old	9'-0" x 197'	½"	60	41.4%	35.2%
3.	May 1953		2058		615,000	1300°F	Lime Marl	New	10'-6" x 133'	¼"	60	New Kiln	New Kiln
4.	May 1953	900	1380	962,000	660,000	1317°F	Limestone, Clay	Old	8'-6" x 164'	¼"	66	52.4%	31.2%
5.	April 1954		2280		613,000	1470°F	Lime Marl	New	10'-6" x 133'	¼"	72	New Kiln	New Kiln
6.	May 1953	860	1500	1,100,000	650,000	1432°F	Limestone, Cement Rock	New	8'-0" x 125'	½"	90	74.0%	41.0%
7.	May 1954	780	1200	995,000	650,000	1350°F	Limestone, Clay	Old	8'-3" x 164'	½"	36	53.8%	34.7%

§1. Norddeutsche Hutte, Bremen-Oslebhausen. 2. Portland-Zementwerke, Anneliese-Ennigerloh/Westf. 3. Bamke u. Blackmann, Beckum/Westf. 4. P.Z.W. Heidelberg AG Werk Burglengenfeld. 5. Portlandzementfabrik Hardegsen AG, in Hardegsen. 6. Allentown Portland Cement Co., Evansville, Penn. 7. "Terni" Societa per l'Industria e l'Elettricita cementeria, Spoleto, Italia.

†Coolers in all plants are Fuller type.

High Thermal Efficiency
by 9 leading cement companies

After more than two years of closely studied operation the first American installation of a Fuller Preheater in conjunction with a short rotary kiln, at the Evansville, Penna., plant of the Allentown Portland Cement Company has achieved record efficiencies. Daily output has been raised from 860 bbl. (without preheater) to 1500 bbl. and fuel consumption has been reduced from approximately 1,100,000 Btu per bbl. to about 650,000 Btu per bbl. These astonishing results follow the pattern of those achieved in European installations where the preheater first saw service, and they all add up to very substantial savings in kiln operations.

IT'S NOW AN ESTABLISHED FACT...
The Fuller Preheater—

1. Makes effective use of kiln gases (otherwise wasted) to heat raw materials before they enter the kiln.
2. Increases clinker production while reducing exit gas temperatures to between 500°F and 600°F.
3. Greatly increases daily capacity.
4. Substantially reduces fuel consumption.
5. Acts to extend the life of existing short kilns.
6. No internal moving parts.

Designed for existing as well as new short kilns, the Fuller Preheater makes the practical fuel-burning capacity of the individual kiln its only capacity limitation. If you're interested in cutting fuel costs and increasing output... if you're interested in sizeable dollars and cents savings... write for details as they apply to your plant operations.

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PR-ST 1161

Good Neighbor Policy Pays Off—

Bridgeport quarry of Bethlehem Limestone Company reduces accidents, noise, dust, and blasting vibration and beautifies property

Another ON THE SPOT Report

THE rapid encroachment of residential areas and the growing public insistence on the elimination of noise and dust has become one of the most serious problems confronting quarry operators, in some cases threatening their very existence. Many operators have succumbed to pressure and quit, or have moved their operations to more remote locations, often at great cost to themselves. Others have faced the problem early and intelligently and have taken every possible step to eliminate nuisances, to make their operations attractive, and to gain the good will of their neighbors. One of the first to recognize this growing problem and to take adequate steps to meet it with a good neighbor policy was the Bethlehem Limestone Company (a subsidiary of Bethlehem Steel Corporation) at its Bridgeport, Pa., quarry.

By WALTER E. TRAUFFER

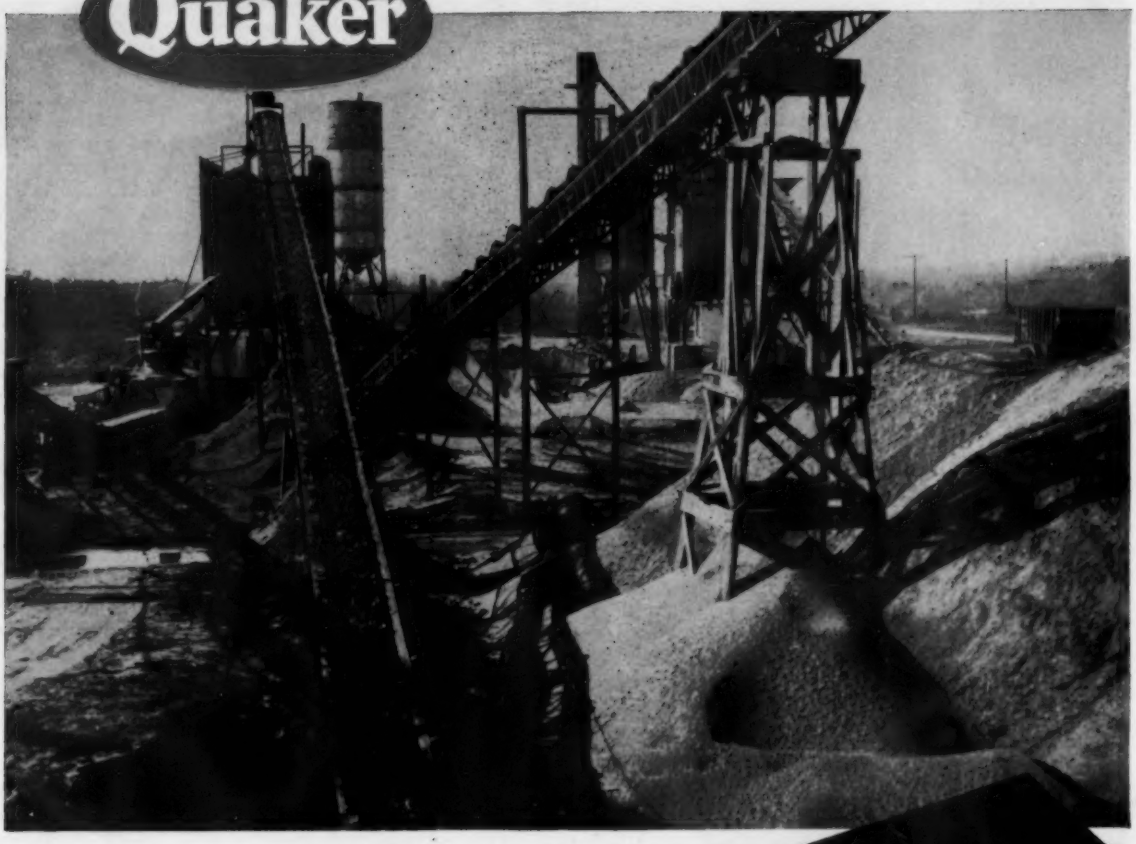
The Bridgeport quarry is just outside the city limits of that community of 12,000 population, about a mile south of Norristown. There has been a quarry at this location since Revolutionary days, on a smaller scale, of course. In 1930 the Bethlehem Steel Corporation took over the property, then being operated commercially, and built the present modern plant to supply its own needs. The output is primarily flux stone for its blast furnaces and bottom stone for its open-hearth furnaces. These cover the full range of sizes from 4 in. down to sand. Most of the stone has a very low silica content, but there is also some higher silica rock in the deposit which is processed separately and sold for commercial use. Since 1930 the capacity of this plant has been expanded from 200,000 tons annually to over 1,250,000 tons. The working force totals 150 men on two shifts daily.

The property is bounded on the north by State Hy. No. 202, a major artery through an important industrial area. On the east is an interurban railway carrying passenger trains every half hour. On the other sides are homes and small businesses, and subdivisions are now being built right up to the western border of the property which is farthest from the quarry.

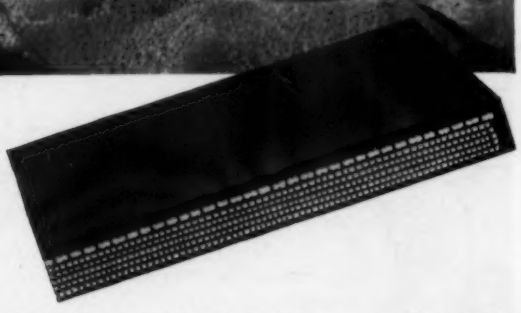
The Bridgeport quarry is in upper Marion Township, the original eastern terminus of the Pennsylvania Turnpike, which runs just back of the quarry. As a result, the growth and prosperity of this area spurted sharply, increasing the quarry's problems. The eastern and northern extensions of the Turnpike and the expressway to Philadelphia now meet here, and this will mean further growth. The problems will become further intensified, and the company is continuing its efforts to establish this operation as an asset to the community.

During the 30's these operations were not so closely hemmed in that ordinary precautions would not suffice. However, the war boom created such expansion in this important steel-producing and manufacturing area that it began to build up rapidly. Company officials saw what was coming then and began to take every possible measure to fit into the coming pattern. As a result

Aerial view of Bethlehem Limestone Company's plant and quarry at Bridgeport, Pa. Along the face of the quarry (foreground) is a major highway, at the left is an interurban railway, and in the background is the Pennsylvania Turnpike.



Takes the impact and roughest abrasion of sharp, jagged loads



Your Quaker or Quaker Pioneer distributor can supply not only your standard needs — but also your highly specialized ones. You'll find him a prompt dependable money-saving source for everything you need in rubber products. Write for free brochure and name of your nearest distributor.

No matter what you consider most important in a conveyor belt, there is a Quaker-Quaker Pioneer belt constructed to meet your need. This one, for instance, is especially made for tough shock resistance. Highly flexible, it is strong cotton duck, with average cover tensile strength 2500 to 3000 lbs. Skim coat between plies. For jobs requiring even greater troughability, tension resistance and flexing, Quaker can supply belts of new high tensile strength rayon or cotton-nylon fabrics of any desired cover thickness. Complete line offers industrial rubber products including hose, packing and moulded rubber for every use.

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H. K. PORTER COMPANY, INC.
QUAKER RUBBER DIVISION
Philadelphia 24, Pa.
QUAKER PIONEER RUBBER DIVISION
San Francisco 7, California

Before the vine-covered laboratory building at the entrance to the plant is the only sign permitted on the property.

this operation has been for some years an outstanding example of a "good neighbor" plant, with the minimum of noise and dust, and it has been made safe and attractive, not only for the workers, but for the passersby, as well.

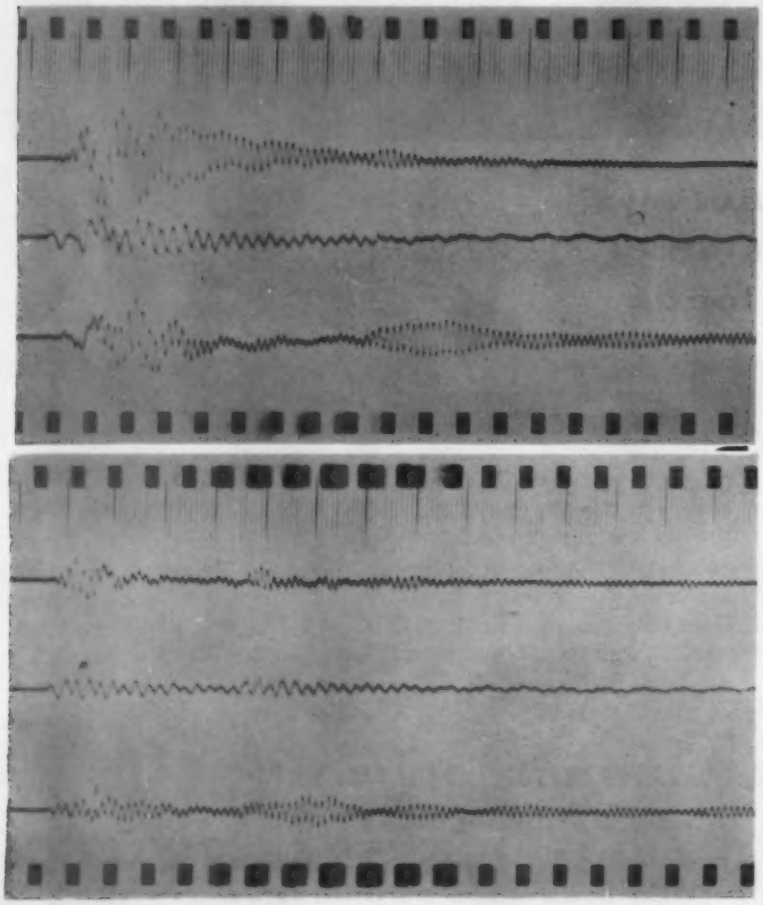
Blasting vibration and noise were at one time the cause of complaints from neighbors. To meet this problem the firm of Leet Associates, Howard, Mass., was appointed as blasting consultants; and their advice is used as a basis for planning shots. Regular reports are made to them, and any recommendations which they make are carried out. Scientifically planned multi-second delay shooting so greatly reduces vibration that there is no possible damage. Single-row shots are used, and it has been found that ending the holes close to the quarry floor instead of below helps to reduce vibration. Some toes result, but these are shot out later with snake holes. Using a drop ball for secondary breakage also helps. For psychological reasons shots are always made at the same time, from 2 to 2:30 p.m. They are never made when trains are going by.

All shots are recorded by a 3-component Leet seismograph located on the eastern edge of the quarry at the top of the face, between the quarry and the nearest residential section. This location was selected because vibrations there would be greater than in more remote residential sections.

Every three months an aerial photograph is taken of the quarry. Every shot made in the next three months is spotted on a separate print of this photograph and a record is kept of its size, loading, etc. The seismograph record of each shot is also attached to its photo. These records have been kept for the last 3½ years and are available whenever needed.

Quarrying is done in 45- to 50-ft. benches, and drilling with two 6¼-in. rotary drills. Primacord connectors and Nitramon explosives are used. The yield averages about 4½ tons per pound of explosive.

The ground water problem in the 230-ft. deep quarry is a serious one as there is leakage near the bottom.



Left: Seismograph records of two shots made in the quarry. (See opposite page.) Below: Data on the same two shots.

8/1/55

Shot #1
Time: 2:16 P.M.

Description: Five well drill holes 20' spacing, 15' burden, 50' depth, shot east from -34' level using prima cord connectors at 17 milliseconds delay.

Explosive charge:	1,423.0#
Pelletol	250.0#
Total	1,673.0#

Shot #x
Time: 2:56 P.M.

Description: Fourteen well drill holes shot from -50' level, 10' depth, using prima cord at 9 milliseconds delay.

Explosive charge: 400.0#

Above: One of the aerial photographs of the quarry on which blasts are spotted as they are made. This one records two different shots made in one day. (See seismograph records on opposite page.)

Nearly half of this water is used for washing the stone. Rainfall greatly increases this water flow. Adequate pumping facilities are provided at a sump at one side of the quarry into which all water is channeled. The pump house is an attractive concrete block structure.

This water has one advantage; it keeps most of the quarried stone wet —with the result that little dust is created in the plant. Water sprays at the secondary crusher and on the screens provide further insurance against dust. All buildings and conveyors are enclosed, and at one transfer house a bin was erected to collect the unavoidable spillage.

The most heavily-travelled roads around the plant and stockpiles are paved. All other roads, including those in the quarry, are treated with calcium chloride to keep them as nearly dustless as possible.

It was inevitable that in such a prominent location many passersby would want to look over the operations and in so doing endanger themselves. It was typical of the company's attitude that, instead of blocking out the curious entirely, the elevated observation platform was built near the entrance to the property.

The main entrance road to the plant. Note the heavy concrete wall guarding the quarry (left).

The safe observation platform from which "sidewalk superintendents" can observe operations in the quarry.

One view of the plant and quarry which may be seen from the observation platform.

Right: Looking in another direction, one sees this view of the quarry, which includes a part of the road and a concrete protecting wall.

This is of solid concrete construction and has a 4-ft. high steel railing over which children cannot climb. The only time "sidewalk superintendents" are barred from the platform is when a blast is being made. A flagman then also blocks the entrance to the property. On the platform is a sign reading as follows:

> NOTICE—You have a complete view of our operation from this platform. You are welcome to stay as long as you wish but **Stay on Platform.** Your presence elsewhere will be considered trespassing and you will be requested to leave the property at once.

The company's safety measures for its employees are equally complete and effective. Every possible precaution is taken in the quarry and plant, and regular safety meetings are held. The first aid team always rates high in the annual Bethlehem, Pa., plant competition of 24 teams. Workers all wear safety shoes and hard hats. Standard types of safety glasses are issued to all employees. A new welfare building in the quarry provides a place where the men can change clothes and clean up. Similar facilities are, of course, available at the plant.

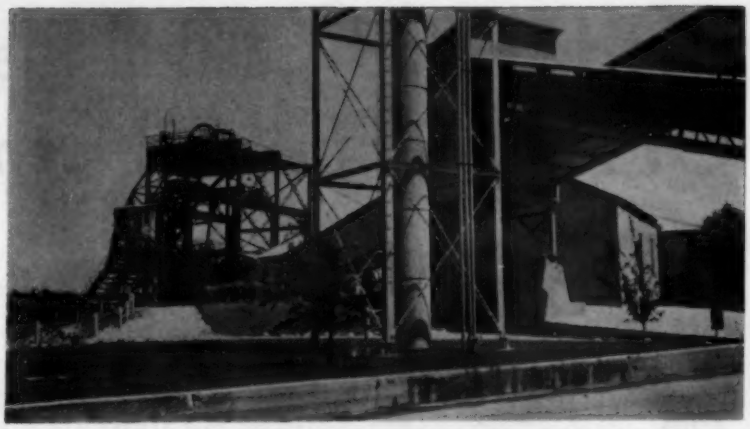
The operation has an excellent safety record. During the last five years it has won awards from the Bureau of Mines and National Safety Council for excellent safety performance.

On this property the company has its crushed stone plant, an office, and other buildings; and there are also aggregate-bituminizing, ready-mixed concrete and concrete pipe plants operated by other companies. Across the highway is another company's asphalt plant, also on Bethlehem company property. These plants use up all of the commercial stone the company produces. All are equipped to suppress dust to the greatest possible extent. Both black-top plants have both dry and wet dust collectors. They are also bound to keep up the appearance of their plants and the property.

Wherever possible, and particularly at the entrance road to the property which is close to the quarry, there are lawns, flowering shrubs, and evergreens. An ivy-covered laboratory building at the entrance is another

touch. Along each side of the property there are maple trees 10 to 12 years old which already form an effective screen. At the entrances and at points where the quarry is close to the property boundaries a 7-ft. Cyclone fence keeps out children and other would-be trespassers. Along the main highway which borders one side of the quarry earth fills insure against any out-of-control vehicles falling into the quarry. The company also put in a concrete curbing along the highway and the main entrance road for further protection. The only signs on the property are no-trespassing notices and a small sign at the entrance listing the names of the various companies. The company provides a soft-ball field for the local Y.M.C.A.-sponsored league.

Company management people participate in local doings of all kinds; they belong to the Chamber of Commerce, Kiwanis, Rotary, and other clubs, and work on drives for the Red Cross, Boy Scouts, and other worthy causes. Boy Scouts have been permitted to camp on another company property which is held in reserve for future quarrying. The record in government bond drives is also good—120 out of the 150 employees are on the pay-roll deduction plan.



Grass and trees are planted wherever possible about the property. Here the hoist house and crusher building are shown.

Concrete paving is extensively used, as here at the truck scale house. In the left background is a hopper which collects spillage at a conveyor transfer house.

Halliburton to Add Five Silos For More Storage Capacity

Proposed construction of five additional storage silos at a cost of $250,000 will almost double the storage capacity of the Halliburton Portland Cement Company in Corpus Christi, Tex.

Presently equipped with 12 silos, the Halliburton Company stores 110,000 bbl. of cement. Capacity would be increased to 200,000 bbl. with the addition of five silos.

Ellroy King, vice-president of the concern, stated that no increase in production is planned, but that addition of a loading dock is contemplated.

Kaiser Aluminum & Chemical Building Refractory Plant

Construction of Kaiser Aluminum & Chemical Corporation's new basic refractory brick plant at Columbiana, Ohio, is being pushed ahead to meet the increasing need for basic refractories.

Contracts for the erection and completion of the buildings for the $4,000,000 plant have been awarded, and the plant is scheduled to be in operation early next summer. Engineer contractor for the Columbiana project is Kaiser Engineers, a division of the Henry J. Kaiser Company.

The main building will be of steel construction and will house, in addition to the mill and press sections, a primary crushing and drying plant, a warehouse section, the storage silo area, a machine shop and a laboratory.

Production will be concentrated on basic brick for the cement, steel, glass, and copper industries and will be divided between the high magnesia periclase-chrome and chrome-periclase types. The periclase, which is high-purity calcined magnesia, will be supplied by Kaiser Chemicals Division's fully-integrated raw materials plants in California. Chrome ore will be imported.

Cement will be one of the materials traded by Poland to Ceylon under the terms of a mutual trade agreement signed by these two countries recently. In exchange for cement and other building materials, Poland will receive products native to Ceylon, which is without mineral wealth.

Peru's Third Cement Plant To Produce 2,000 Bbl. Daily

Pacasmayo, Peru, 400 miles north of Lima, will be the site of the National Portland Cement Company's new plant in that country.

The plant, which will be completed in 1957, will produce 2,000 bbl. of cement daily and will cost an estimated $5,000,000. When completed, the plant will add approximately 15 percent of the present annual output of two existing plants in Peru. A fourth plant is under construction near the city of Chiclayo, farther north.

New Plant Needed In Iran By Tehran Gypsum Company

The Tehran Gypsum Company, Tehran, Iran, is seeking the purchase of a new plant and equipment to modernize its facilities for mining and producing gypsum.

Tehran Gypsum has mine sites at Touchal and Megarabad, and produces gypsum at Hashemabad.

A plant of 1,000-ton daily capacity is necessary for another of the company's operations, contemplated at its largest mine, in Touchal.

Modernized Catskill Plant Of Alpha Portland Cement

all phases covered in extensive improvement project

By BUREN C. HEROD

Another ON THE SPOT Report

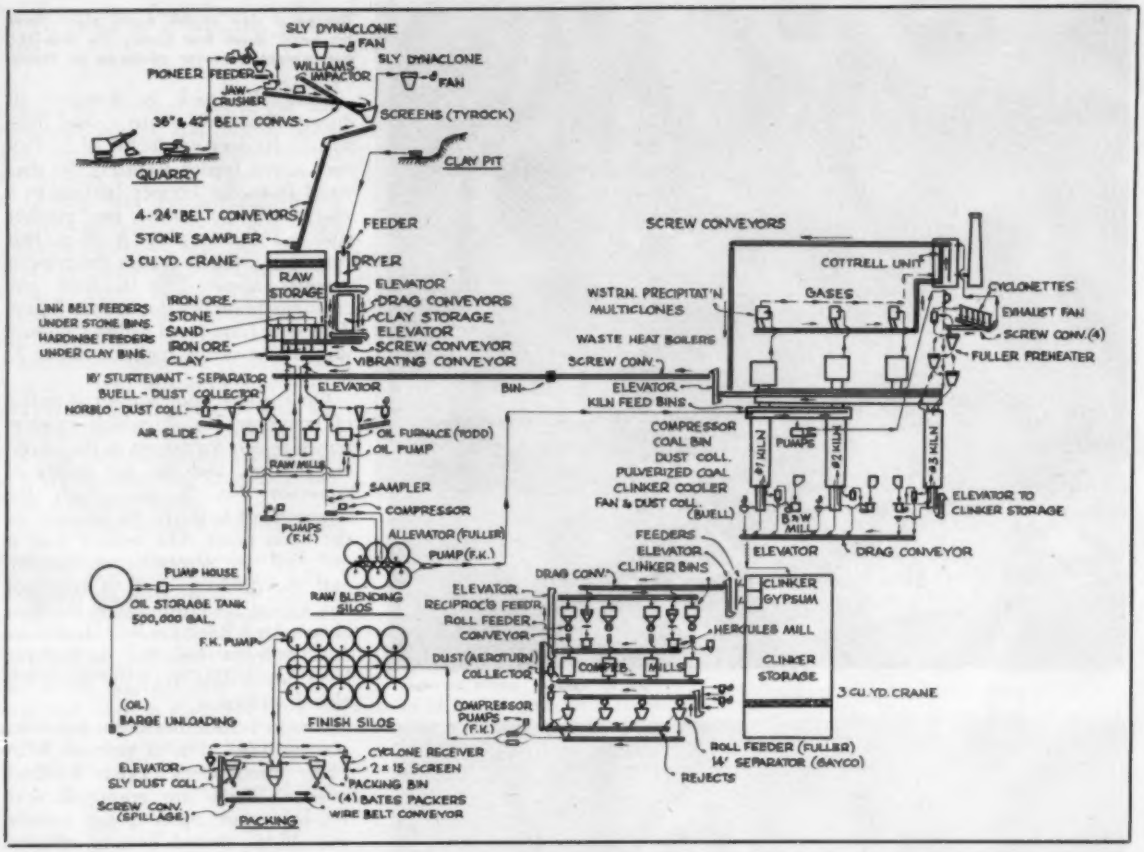
WITH the finishing touches now being made, Alpha Portland Cement Company, Easton, Pa., has virtually completed the $4,000,000 expansion and revision program initiated at its Catskill, N. Y., plant in January, 1954. This project, designed to reduce costs while increasing output to meet demands of the New England and New York markets, has resulted in raising annual cement production from 850,000 bbl. to 1,200,000. The fact that the nearly 50 percent larger capacity has been attained with no increase in operating personnel testifies to the efficiency of planning and design.

This is the third rehabilitation of the plant, which the company originally acquired in 1909, and is by far the most comprehensive. Every segment of the operation, from quarrying to finish grinding, came in for its share of attention in the extensive program. Installation of a Fuller-Humboldt suspension preheater, the second to be erected in the United States; a new 10- by 120-ft. Traylor kiln, replacing an old 8- by 120-ft. kiln; and erection of a large new raw-stone storage and raw-mill building are among the outstanding features.

Far from the least important re-

A view of the Alpha Portland Cement Company's operation at Catskill, seen from the west. A part of the former tramway structure is visible at the first transfer point (right center).

Photo by Colund: Aerial Surveys



A schematic flow chart on the modernized Catskill, N.Y., plant of the Alpha Portland Cement Company.

vision was the construction of new crushing and screening buildings at the stone quarry, along with the replacement of an old aerial tramway with a quarry-to-plant conveyor approximately one mile long. At the finish-mill building, where conversion is nearing the final stages, addition of two Bradley Hercules mills ahead of the four tube mills in the finish-grinding circuit has raised hourly finished material production from about 160 bbl. to 250 bbl.

Not as readily apparent as some of the larger features in the improvement program, but nonetheless important to its ultimate success, is the rearrangement and redesign of the entire power distribution system. Enlarged operation called for a greater amount of purchased power to complement the plant's own 3,000 kv.-a. waste heat generator capacity and the 2,000 kv.-a. already brought in from public utilities. Therefore an additional 1,500 kv.-a. is purchased and metered to the quarry. Old underground cables were removed, and a new conduit system was installed.

Since waste heat from the kilns is utilized in producing power solely for the raw-grinding and kiln departments, a shutdown of those systems would not affect quarrying and finish-grinding operations. Nor would interruption of purchased power service preclude raw-mill feed to the kilns and kiln production since these two operations are independent of that supply.

Indicative of the long-range planning that went into designs for enlargement and rehabilitation of the plant is the raw-material sampling program initiated in the quarry about 8 years ago. Many of the revisions to operating equipment were based on information so obtained, showing the various grades of feed available in place at the quarry. Coupled with the company's years of experience in making blends, the resulting modernized operation has the potential to produce any known type of cement.

Despite the size and complexities of the above revisions and additions, the complete program was carried out with no loss of operating time or production, and hook-up was completed over a 72-hour period.

Present quarrying operations are carried on about one mile west and uphill from the plant site on the west bank of the Hudson River. The bulk of the working face is made up of the Black Rock and Upper and Lower Becraft limestone. A range of 75 to 95 percent calcium carbonate is present in these strata, which have a dip of about 20 degrees to the east. Due to the fact that the rock in place has sufficient silica and iron oxide content, no additives are required in processing, and the need for the previously operated clay bank is eliminated.

Face samples are taken at regular intervals; and based on their analyses, rock is selectively excavated for the particular analysis desired. A well drill and two wagon drills are used for primary and secondary drilling in the rather well fractured deposit; and after blasting, the broken rock is loaded by two 2½-cu. yd. Marion shovels into 10-ton end-dump Mack trucks. Five of these units are employed in hauling rock to the new 250-t.p.h. primary crushing plant erected on the quarry floor, only a few hundred feet from the present working faces.

Photo by Colund: Aerial Surveys

This aerial view of the Alpha plant (from the east) shows how closely the mile-long quarry-plant conveyor conforms to topography.

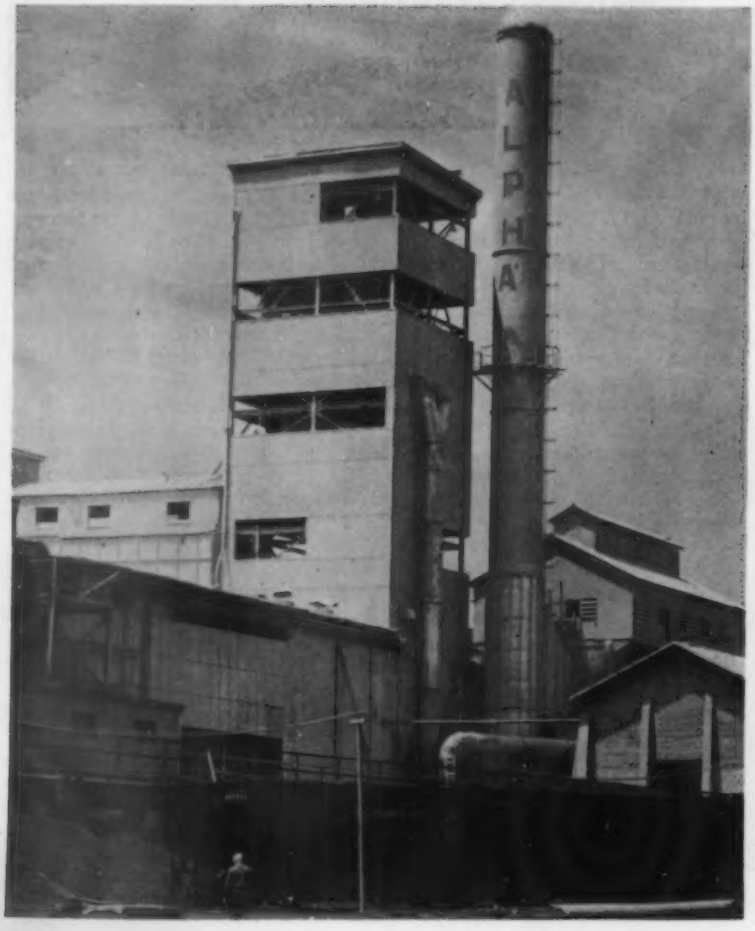
Here the rock is dumped—at quarry floor level—into a steel hopper 15 ft. deep. A 5- by 19-ft. Pioneer apron feeder transfers the material from the hopper bottom to a 48- by 60-in. Traylor jaw crusher with a 3½-in. setting. A 42-in. belt conveyor (No. 1) carries the crusher product about 270 ft. from the crushing plant to the screen house. This steel frame and siding structure stands four stories high, or about 77 ft.

On the first floor is the tail pulley of conveyor No. 2, which receives screen rejects for return to the crusher building, and the tail pulley of conveyor No. 3, on which the screened rock starts its journey to the main plant. The second floor is occupied by screening equipment, and the discharge end of conveyor No. 1 from the crusher is on the floor above. An 8,500 c.f.m. Sly Dynaclone dust collector installed on the top level draws dust from the lower enclosed screens.

Crushed rock is discharged from conveyor No. 1 to a pair of 5- by 14-ft. double-deck Tyler Ty-Rock screens. These are equipped with 1½-in. square opening top screens, and ¾-in. slotted bottom sections. Material over both decks of both screens is chuted to the 36-in. belt of conveyor No. 2 and is returned to the crusher building, where it is fed to a Williams No. 475 reversible Impactor. The Impactor product drops to the belt of conveyor No. 1, where it joins the primary crusher discharge and is carried back to the screening plant, thus closing the crushing circuit.

Minus ¾-in. throughs from the bottom deck of each screen are chuted to the ground floor and conveyor No. 3 for feed to the main plant. The conveying system between screen house and main plant is made up of four sections—the longest being 1,400 ft. on centers—carrying 24-in. belts. The first two are driven by 50 hp. motors, and the final two by 30 hp. units. Each section was prefabricated by Hewitt-Robins to meet ground contours. This new system replaces an old aerial tramway that had been in operation for a number of years, and provides for feeding raw storage at a 300 t.p.h. rate.

At the plant site, the rock is dis-



This new suspension preheater is the second installation of this type in the United States.

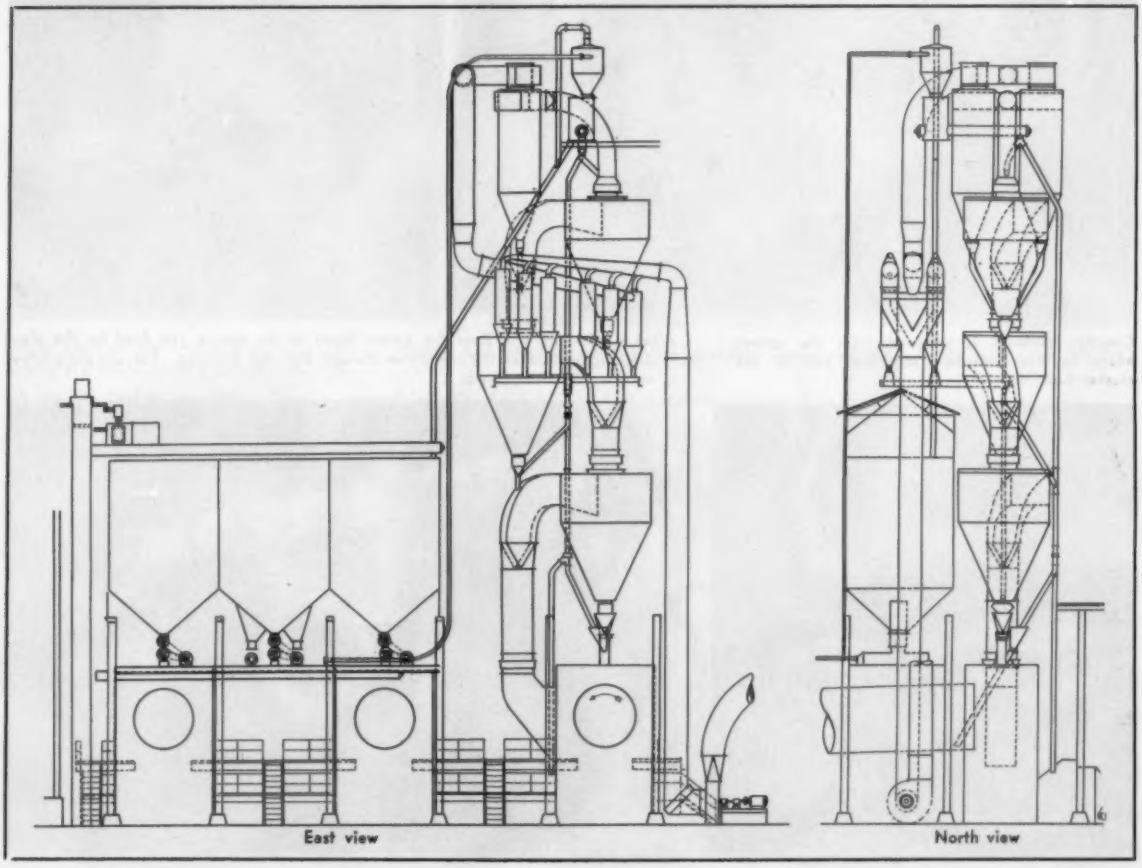
Right: From the crusher house (left) material is carried up to the screen building (right).

Photo by Colund: Aerial Surveys

charged at the west end of the new raw-stone storage and mill building. This large structure—approximately 240 ft. long by 83 ft. wide—consists of 12 bays with steel framework and roof trusses supported by 17-ft. high concrete sidewalls. The two easternmost bays house the raw-mill section. With an 80-ft. height, the building easily accommodates an overhead 9-ton crane that traverses the 200-ft. length of storage space. About 10,000 tons are stored in approximately 19,000 sq. ft. The former raw-stone and clay-storage building adjacent to this new structure has been retained to accommodate clay inventory solely on a standby status.

A sampling tower is located at the raw feed discharge point, and with this second sampling control—initial samples being taken at the quarry—the operator of the 3-cu. yd. P & H overhead crane can establish separate piles of high, low, and blended grades of feed. From these piles, the crane fills two stone bins of about 200 tons capacity each. Two other

Below: The four stages (cyclones) of the suspension preheater installation are visible in this drawing. A portion of the exit gases from No. 3 kiln (right, in East View) are drawn up through the preheater intake duct which enters, tangentially, the upper section of the lower, or final stage. These gases continue through similar ducts which can be seen leading upward from the top of each cyclone to the next collector.
Ground raw feed is discharged into the duct between the top cyclone (first stage) and the next lower stage (top portion of East View) by a constant head feeder which is supplied from the kiln feed bins (left) by a pump.
Initial dust collection is effected in the two batteries of six cyclonettes each (upper middle, both views). About 50,000 c.f.m. of the kiln gases are drawn through the entire system by the fan at lower right (East View).



bins—each divided and located one on each side of the stone bins—provide for storage of other materials such as sand and iron ore, when these are desired or needed to meet particular specifications.

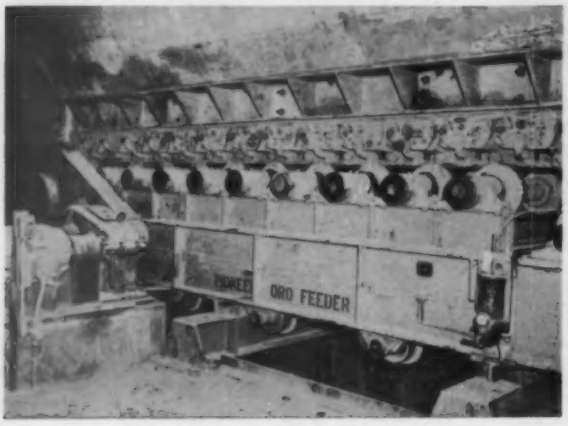
These six storage compartments are designed to provide—as two separate groups—for two flows of identical materials. One stone bin and one divided blending material bin supply each of two independent but identical and parallel systems in the raw-mill department.

Below each of the two stone bins a 28- by 90-in. Link-Belt reciprocating feeder transfers the minus ¾-in. stone to a Carrier vibrating conveyor. These units discharge to Jeffrey bucket elevators from which the material is fed into two 16-ft. Sturtevant separators—one in each of the two flow lines. To attain a "dry as grind" system, two Todd Shipyards Corporation hot air furnaces were installed. Each supplies 16,500 c.f.m. of air at 800 deg. F. to its respective separator. To avoid discomfort to personnel and heat loss, all separation and attendant dust collection equipment have been insulated with Armstrong Cork insulation. A new 500,000-gal. Graver oil storage tank was erected to provide 6 to 8 months' supply of Bunker C fuel oil for the two oil furnaces.

When separation takes place in the two Sturtevant units, the center cone discharge of coarser material is chuted to their respective Babcock & Wilcox high-speed vertical ball mills. The resulting raw-ground rock is then chuted to the raw-feed bucket elevators previously mentioned and again elevated to the separators in closing the raw-mill circuit. Outer cone discharge—90 percent passing 200-mesh—from the separators is chuted to 8-in., 50 t.p.h., Fuller-Kinyon pumps. Each of these two units is furnished with 30-lb. pressure by its respective Fuller C-100 air compressor and transfers the raw-mill product through a 5-in. line to the raw-mill material blending silos.

Dust carried off in the airstream through the separators is passed first through a Buell mechanical dust collector and then to a 35-ft. Norblo bag unit whose fan (one in each of the parallel flow lines) draws 19,000 c.f.m of air through the system. In using the mechanical unit to recover the relatively coarser particles—about 60 percent of the dust—the bag unit is relieved of this load and requires less shaking. Material dropping out of the airstream in the Buells goes directly to the ground material pumps. Finer dust carried to the Norblo units and collected there is passed through an airslide to join the Buell discharge.

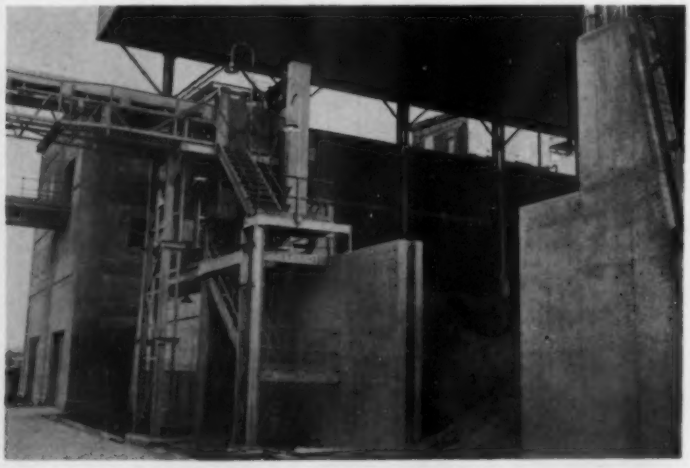
Below: Rock is transferred to the primary crusher by this feeder below the truck hopper.

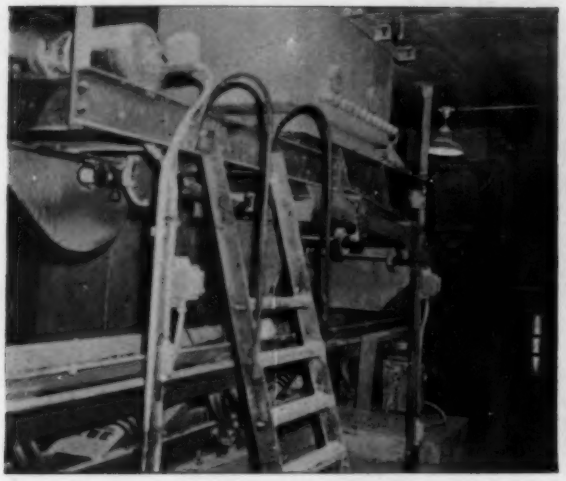


Below, right: Minus ¾-in. stone is separated from the crusher discharge by these double-deck units in the screen house. Dust collection ducts are visible above the screens.

Oversize material is returned from the screen house to this secondary reduction unit in the crusher building.

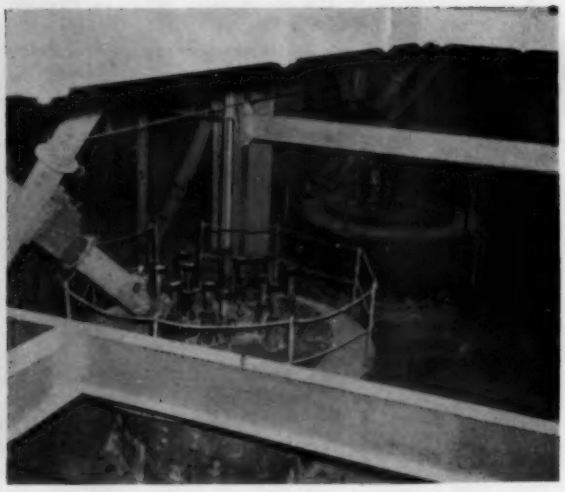
After a mile-long trip from the screen house at the quarry, raw feed for the plant is discharged here at the raw stone storage and mill building. The sampling tower is seen in the foreground.



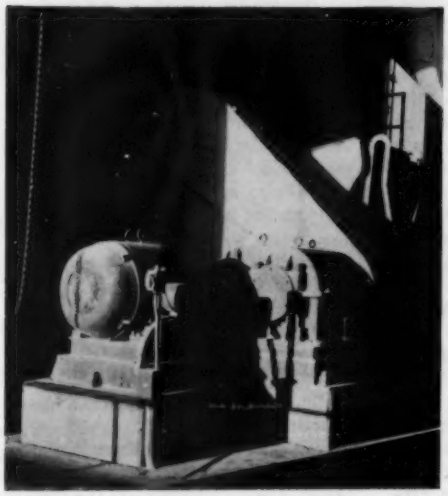


Above, left: One of these feeders and vibrating conveyors is located below each stone bin.

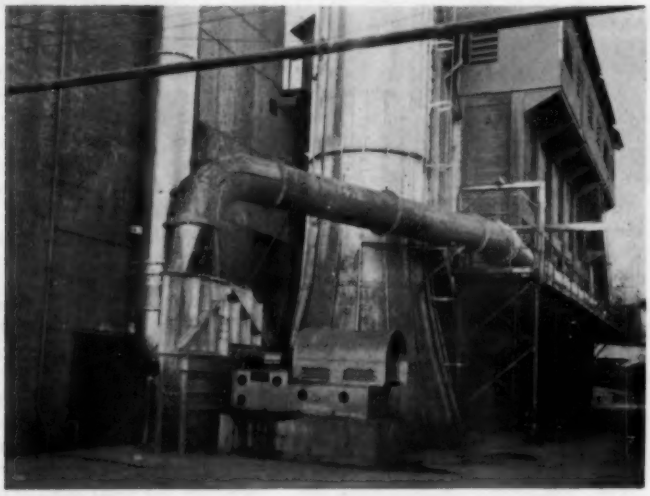
Below. Each of the two parallel and identical raw mill flow lines is served by one of these fans for the separators and dust collectors.



Above: Coarse material rejected by the two separators is chuted to these high-speed vertical ball mills.

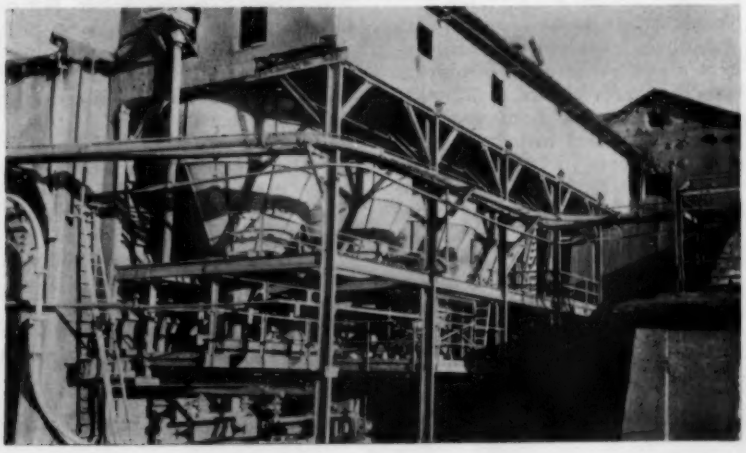


Below: One of the two new roll-ring-type mills in the finish grinding circuit. Tube mills are fed the product of these units.



Above: Kiln gases diverted to the preheater are drawn through the system by this fan.

Below: The finish mill product is normally fed to these four separators for processing.



A third sampling of raw material before it reaches the kiln operation is made just ahead of the pumps which deliver raw-ground rock to the blending silos; and desired composition correction is made by diverting the material to any particular silo for blending. Below this 3250-ton storage, Fuller rotary valves measure out the ground rock for pumping to the kiln bins in the kiln room.

Two of the three Traylor kilns are older units, and each has an inside diameter tapered from 10 down to 9 ft. over its 120-ft. length. The No. 3 kiln, installed during this expansion program, is also 120 ft. long, but has a 10-ft. diameter throughout.

The No. 1 and No. 2 kilns are fed raw-ground rock directly from the raw-feed bins by a 14-in. screw conveyor. Operation of these kilns is standard, and daily output of each is about 1,100 bbl. Waste gases produced in burning are passed entirely to the waste boiler plant just behind the feed end of the kilns. In the case of No. 3 kiln, the gases are split between feed to the above boilers and the new suspension preheaters. Approximately 60 percent goes to the latter. Of the entire plant's power requirements, about 50 percent is met by this steam-generated power supply.

The Fuller-Humboldt preheater installation ahead of No. 3 kiln consists of four vertically-arranged cyclone collector stages with gas ducts, a dust collector, and an exhaust fan. That portion of kiln gases diverted to the preheater by a water-cooled damper on the preheater intake is drawn through the system at about 50,000 c.f.m. and a 32-in. water gauge by a Robinson fan. An automatic watt-hour meter on the latter can be set to maintain any volume desired in relation to the material being fed into the system.

Exit gases from the kiln are drawn upward through a duct (the preheater intake) that opens tangentially into the lowest, or final collector stage. Similar ducts furnish gas from the fourth to third, and third to second stages; but from stage two the gas is divided to two relatively narrow cyclones (6 ft. 6 in. I.D. as opposed to the 14-ft. I.D. of the cyclones in the succeeding three stages). The two smaller units together comprise the initial stage, which in being designed as a split phase increases collection efficiency.

From this stage the gases pass through two parallel batteries of six cyclonettes each, for initial dust collection, then through the preheater fan to a Western Precipitation Corporation Cottrell electrical precipitator before exhausting through the stack. An emergency damper—a fan safety cold air inlet— in conjunction with a thermocouple protects the fan against excessive gas temperatures.

Ground raw feed is delivered from the kiln feed bins by Fuller-Kinyon pumps to a Fuller constant head feeder at the top of the preheater. A continuous stream of material is discharged from the feeder into the duct between stage two and stage one at a point near the bottom of the duct. Rising gases carry the material entering the duct up to stage one, where, after separation, it falls through the discharge tube of stage one to enter the duct between stage three and stage two. The succeeding stages are essentially the same—the material being alternately suspended by got gases and collected in the cyclones until final discharge from stage four into the water-cooled feed pipe of kiln No. 3. The preheated feed enters the kiln at about 1,400 deg. F.

Preheater and kiln are very completely instrumented. In addition to fuel and air controls, an oxygen analyzer on the kiln determines the amount of that gas present in the exit gases, while another on the main preheater duct determines if possible leaks are adding undesirable oxygen to the system. Prior to the preheater installation, Kiln No. 3 was operated solo for a short time and was producing about 1,200 bbl. per day. Now, with the preheater, its production averages 1,800 bbl. daily, with less than 900,000 B.t.u. per bbl. put into the kiln.

The Cottrell dust-collecting unit, in addition to handling the preheater exhaust, also services the waste heat boiler system. In order to reduce the load on this older unit, Western Precipitation Corp. Multiclones have been installed between the three waste heat boiler fans and the Cottrell. Dust collected in the latter, plus that from the Muticlones and the dust chamber over the feed ends of the three kilns, is returned to the raw mill circuit through a series of screw conveyors.

Thermocouples installed at each end of the kilns, together with radiation pyrometers on the burning zones, are employed in regulating fuel-air ratios for control of the burning temperatures—2,600 to 3,000 deg. F.—at which the kilns are operated. All three kilns are fired with pulverized bituminous coal from Babcock & Wilcox direct-firing coal mills.

A hammermill is installed in the coal-handling circuit between a reciprocating feeder under the outdoor coal unloading hopper and the above coal mills. This unit provides for reduction of unsized lump coal, when such is more economical, before it is received in the kiln-fuel mills. From this hammermill, coal may aso be delivered to a Strong-Scott mill which, with an auxiliary blower, can pump pulverized coal 350 ft. to the old clay dryer, to the kiln fuel feed bins, or to a large concrete bin from which the kiln fuel feed bins are supplied on week-ends. With these facilities, only one-shift coal handling is required, and storage coal is the only rehandled fuel.

Below the discharge end of each kiln is an Allis Chalmers shaker-type clinker cooler. In the case of the older kilns, these coolers discharge to a common drag conveyor for transfer of clinker to a bucket elevator and thence to clinker storage. The cooler unit below the new kiln has a pulsating damper which keeps the bed of cooling material more mobile. From this cooler a separate bucket elevator carries clinker to storage. This arrangement eliminated the necessity of installing a new drag conveyor long enough to service all three coolers. Air passed through these units is utilized as preheated combustion air.

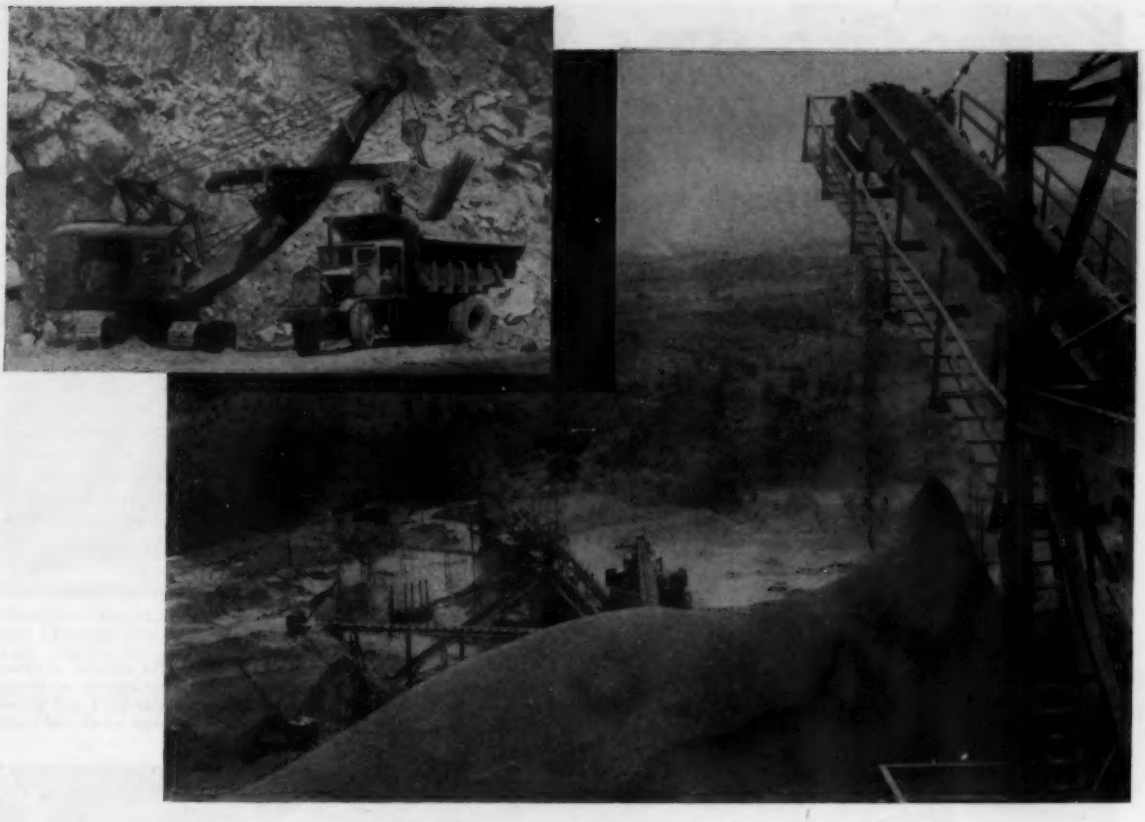
From the point in the clinker storage room where the kiln products are discharged, a 3-cu. yd. overhead crane stockpiles the clinker in an area which has a capacity of about 100,000 bbl. At one end of the storage room are two bins—for clinker and gypsum—which are filled by the crane to furnish feed for the finish-grinding department.

Table feeders below these bins proportion the material onto a drag conveyor. The latter transfers the clinker and gypsum to a bucket elevator, which in turn supplies another drag conveyor feeding two receiving bins in the finish-grinding building.

A Link-Belt reciprocating feeder below each of the latter bins transports the clinker and gypsum to one of two Bradley Hercules mills. Both of these mills are powered by 350 hp. motors and have an hourly capacity in excess of 165 bbl. of minus 20-mesh material. Installation off the two roll-ring-type units in the finish-grinding circuit ahead of the four tube mills, by furnishing a fine feed to the latter, has raised their hourly capacity by about 50 percent.

From the Bradley mills ground clinker is transferred by a screw conveyor to a bucket elevator which discharges into a second screw conveyor

(*Continued on page* 238)



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THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS

Kaiser Gypsum's Seattle Plant—Northernmost Link in a Chain

Long Beach additions and rebuilt facility near completion; second operation at Antioch under way

By HARRY F. UTLEY

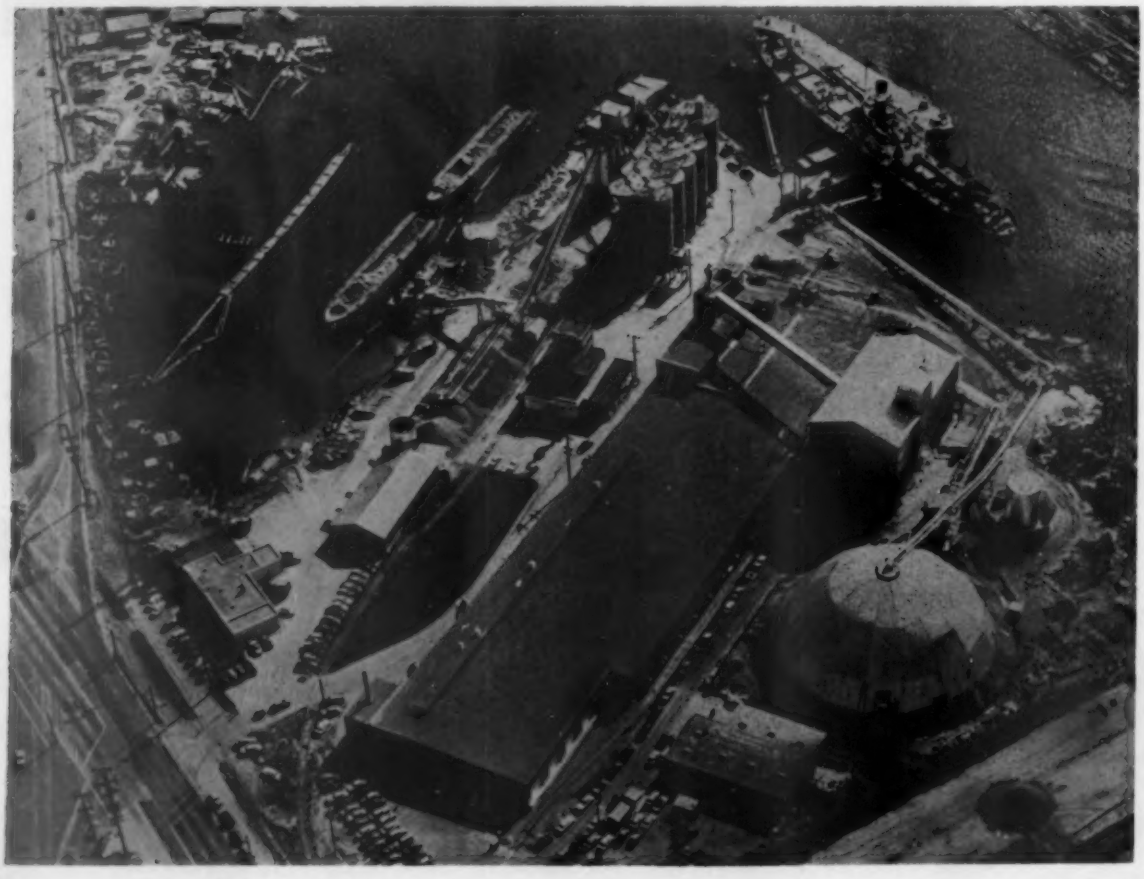
Another ON THE SPOT Report

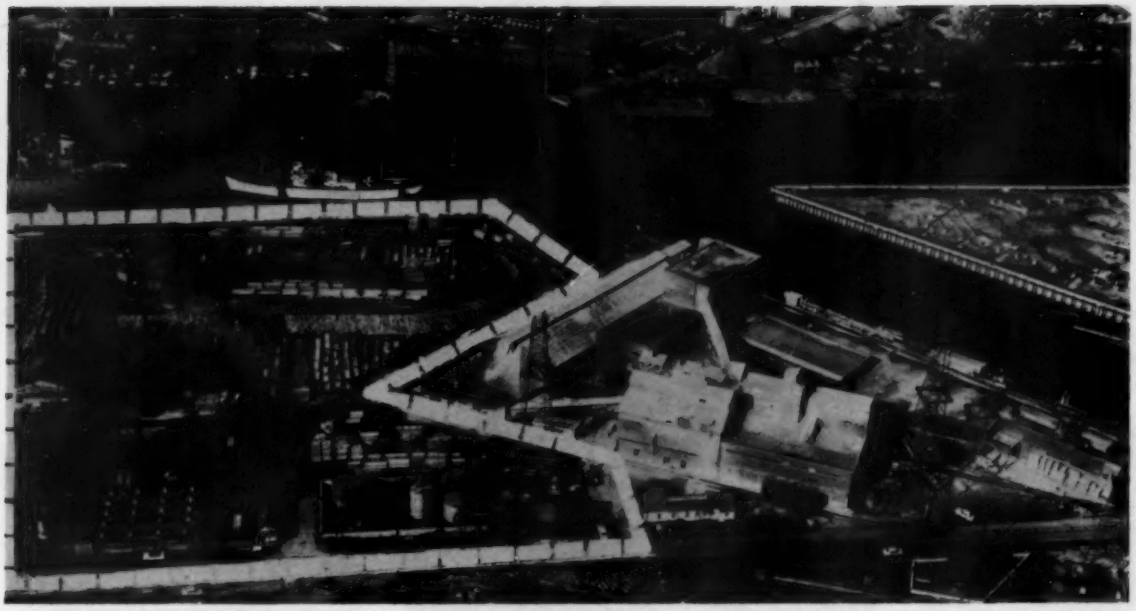
FROM a hesitant start less than eight years ago when it acquired an existing gypsum-calcining plant at Long Beach, Calif., Kaiser Gypsum Co., Inc., appears today to be outstripping competition to become the West Coast's leader in this booming industry.

Acquisition of the old Standard Gypsum facilities at Long Beach in 1948, together with the development of one of the purest, hardest, and whitest gypsum deposits in the western hemisphere, was followed by the addition of modern board-production facilities. A few years later additional calcining capacity was installed. Last year, a new department was added to the Long Beach property to manufacture plaster retarders; it is the only plant of its kind to be found west of the Mississippi River.

Early in 1955, work began on still another tremendous expansion program at Long Beach, after adjoining waterfront land had been taken over, more than doubling the size of the site. Improvements, carried on without interference to production, involve principally the lengthening of the board-production line. This project was undertaken to step up the capacity of these products about 60 percent, permitting production of nearly 210,000,000 sq. ft. of ⅜-in.

Kaiser Gypsum's Seattle facilities. The large building is the board plant; the plaster mill is at the right (center). The circular structure is the domed rock storage building, capable of holding 35,000 tons of raw gypsum rock. At the bottom are the maintenance warehouse and the office building. At the center (left) are the sales offices for the Permanente Cement Company and the Glacier Sand and Gravel Company, with operating facilities and cement silos at the top (center). The ship is pumping bulk cement into a barge which will transport it to Anchorage, Alaska.





An aerial view of Kaiser Gypsum's Long Beach gypsum-products plant, before work was started on the addition. The dotted white line shows additional land acquired for the plant's $3,000,000 expansion program, now practically completed. The new area contains approximately 6 acres and will more than double the present acreage of the plant.

board annually. Drying and calcining facilities are also being enlarged, and the old raw-storage capacity of 20,000 tons is being replaced by a new structure capable of stockpiling 35,000 tons of crushed crude gypsum. The $3,000,000 expansion is now nearing completion.

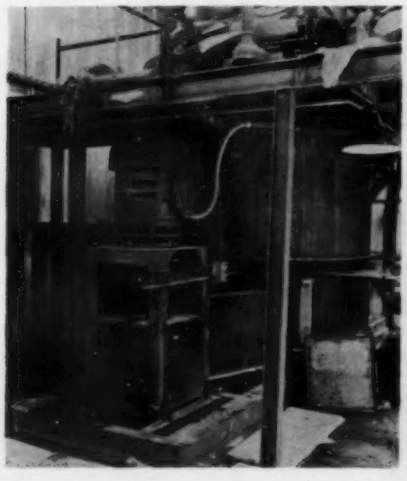
A second step in Kaiser Gypsum's growth came in 1949, when the firm took over the existing gypsum-board plant on the waterfront at Redwood City, Calif., from the old Pacific Portland Cement Company. These facilities, systematically improved in recent years, continued in steady production (annual capacity 94,000,000 sq. ft.) until a day in June, 1955, when a disastrous fire swept the plant. The ashes of the ruins had scarcely cooled, however, before preliminary plans were being drawn in the Oakland offices for replacing the lost capacity.

By August, 1956, still another Kaiser gypsum plant is slated to start turning out board and plaster products, this one at Antioch, Calif. Work on this project is moving along on schedule. Involving a cost estimated at $5,000,000, the new plant will be located on a 38-acre waterfront site on the San Joaquin River; it will have an initial capacity of 180,000,000 sq. ft. of board and about 20,000 tons of plaster.

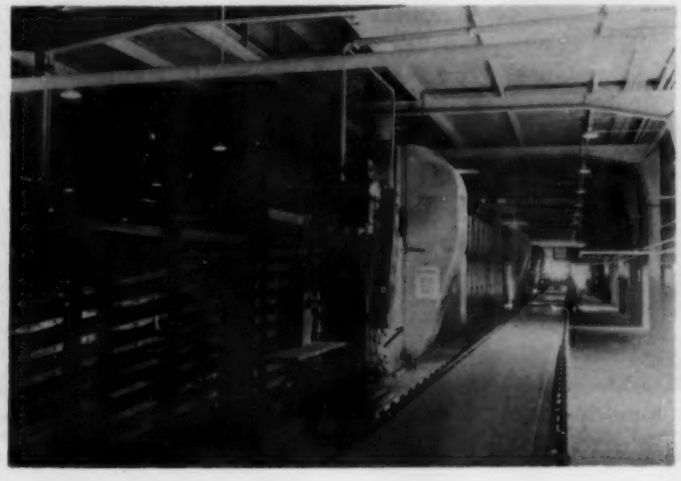
It is on this same 38-acre site, adjacent to the new facility, that equipment salvaged from Redwood City, plus necessary new machinery, is now being erected to replace the lost capacity at Redwood City. The decision not to rebuild on the Redwood City property was due, in part, to the fact that the site had been occupied on a non-renewable lease expiring in 1959.

Work on the plant at Antioch, which will replace the Redwood City operation, is being rushed to completion so that it can get into production this winter. It will be strictly a

Beater and driving motor of the "aqua-pulper" which reduces scrap paper to pulp as an ingredient in board products.



After the board is cut (and punched in the case of lath) it is transferred to the enclosed dryer shown. The dryer, 295 ft. long, has 8 decks and removes an estimated 250 tons of water from the green board daily.



board plant, with an output exactly the same as that attained at Redwood City, 94,000,000 sq. ft. annually.

Prior to the start of the huge projects at Antioch, however, Kaiser Gypsum's newest plant to get into operation was its Seattle facility, which began producing in the fall of 1954. The Seattle plant merits some detailed description here, since it is truly the show-place of the Western gypsum industry and because its design and layout are similar to the larger of the two plants now under way at Antioch. The pattern set at Seattle is likewise being rather closely followed in the enlargement of the Long Beach plant.

Situated on a property nearly 10 acres in extent on the Duwamish Waterway, the Seattle plant has an annual capacity of 100,000,000 sq. ft. of ⅜-in. wallboard, lath, and sheathing, plus about 35,000 tons of hardwall and other plasters. It adjoins the parent Permanente Cement Company packing - and - distributing plant and the concrete-batching facilities of Glacier Sand & Gravel Company, a Permanente subsidiary. Design of the Seattle plant and other plants currently under construction was in the hands of Kaiser Engineers, a Henry J. Kaiser Company division.

Not a movie set, but quarry operations at Kaiser Gypsum's San Marcos Island gypsum deposits in the gulf of Baja California. This "Isle of Gypsum" contains vast reserves of high-quality gypsum rock. Surface quarrying, a short haul to the primary crusher, and belt conveyors and ship loading facilities make for a highly efficient and economical operation.

A dramatic shot at San Marcos, showing a truck dumping quarried gypsum rock into the primary crusher. After primary reduction the rock is gravity-fed to a conveyor belt which deposits it at the dockside stockpile.

The most distinctive feature of this operation is probably the use of automatic-control equipment in the weighing and proportioning of the various ingredients. Few changes have been necessary since the day the plant went into full production, the chief improvement being the installation of Aqua-Pulper beaters, agitators, and tanks which permit the economical utilization of scrap paper as a component in board products. These arrangements largely eliminate the introduction of sawdust in the mix and also the need for a hammermill and roll-paper stock for producing pulp. Similar equipment will be employed in the Long Beach and Antioch plants.

Vessels arriving from the quarries on far-off San Marcos Island berth directly at dockside, unloading *via* boom conveyors to a steel hopper. Gypsum is carried on a 30-in. inclined belt conveyor which builds the 25,000-ton capacity surge pile. The storage pile is protected from the elements by a huge, umbrella-like roof structure of steel 175 ft. in diameter which requires no interior supporting members. Similar storage units are being erected at Long Beach and Antioch. The shiny, dome-like buildings dominating the plant scenes seem likely to become a familiar Kaiser Gypsum landmark in the immediate future.

Three Jeffrey feeders withdraw the crude gypsum from the pile, unloading to a tunnel recovery belt which delivers to a Pennsylvania 30- by 24-in. impact hammermill where the minus 4-in. rock is reduced to a top size of ¾ in. Tramp iron is rejected just ahead of the mill by a Dings magnetic head pulley. The crusher product is conveyed to a pair of 200-ton bins, tonnage enroute to the bins being recorded by a Merrick Weightometer in the conveyor circuit.

The crude gypsum is prepared for calcining in two Raymond high-side whizzer-equipped roller mills which are fed from the bins and which grind to 85 percent passing 100-mesh, the ground product going *via* screw conveyors to two Ehrsam 10- by 15-ft. oil-fired calcining kettles. These 16-ton kettles are jacketed in steel and have one-piece pressed-steel bottoms. Bristol recording pyrometers aid in controlling the temperatures, and dust is recovered by combination cyclone and wet-type collectors.

Calcining time is about 135 minutes, after which the "stucco" is discharged from the kettles at about 345 deg. F. to hopper-bottom hot pits. Transferred by screw conveyors to two parallel bucket elevators, the

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A Universal radial stacker installation for stockpiling.

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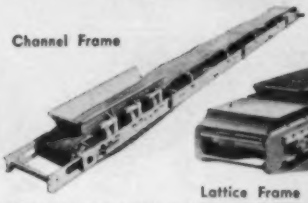
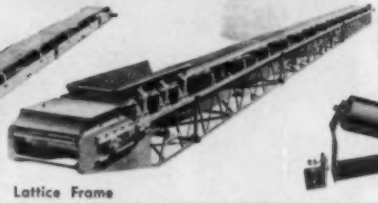
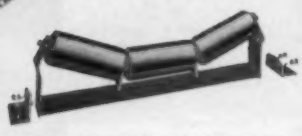


Lattice Frame



Triple troughing roll with self cleaning mounting and self aligning, sealed for life bearings



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product is screened for waste oversize and conveyed either to the board plant or to three 100-ton raw-stucco bins for mixing or processing as sacked plaster products. Preparation before sacking by a pair of St. Regis 4-spout packers involves tube-milling of a part of the product in a Marcy mill, then mixing and intermixing with specified admixtures.

The wallboard department incorporates the familiar forming and drying equipment which has become pretty well standardized in the gypsum industry—an Ehrsam forming belt, or board machine, followed by a Coe dryer. The important difference, however, which sets the Kaiser operations apart and ahead in the industry, is the use of precise, automatic batching of the ingredients by weight rather than by volume. A Jeffrey-Traylor Waytrol system and control instruments insure exact, automatic, and constant proportioning, guarding against any temptation at tampering by unauthorized personnel.

Automation is centralized, indicators on the control panels displaying and controlling the weight of the various factors measured into the mix and accumulating the totals. One of the electronic devices regulates the mix ratios and is synchronized with the travel speed of the board-machine belt. Buzzers and red and green lights are ready to warn of trouble should it occur or to assure that everything is functioning smoothly. Stucco, starch, pulps, and other components are thus correctly proportioned in an interlocked system to conform to the designed mixture by the time it arrives at the Ehrsam pin-type slurry mixer ahead of the forming rolls of the board machine.

Tension control on the paper rolls which form the top and bottom covers of the gypsum board makes for smooth feed to the forming rolls, where the mixture is deposited and rolled to the proper thickness before the green board begins its long run down the board conveyor. The board sets as it is carried along over two 57-in. by 126-ft. Raybestos-Manhattan flat belt conveyors. Ehrsam self-aligning rolls keep the belt in line on the return side. Coming off the 252-ft. long belt sections, the endless board rides over 95 ft. of bronze live rolls to the Ehrsam punch (if lath is in production) and on to an Ehrsam cut-off knife. Roll speed then accelerates to spread the cut sections and deliver them to the inverter transfer table, where the sections are turned over and the direction of travel is reversed as they enter the dryer.

The 8-deck Coe dryer is 295 ft. long over-all. About 80 percent of this length is steel enclosed, with heatproof glass observation ports along the way. Live rolls carry the board through to reach a completely dry state in 1 hour and 20 minutes, the 8 decks being tipple-fed automatically; at the discharge end the board is removed in a similar manner. Steam from a Union generator furnishes the heat for drying, aided by circulation provided by fans. Passage of the board through the dryer is controlled by an electric-eye system.

After the dry board products are taken off, the wallboard is edge-trimmed with circular saws. Lath is packaged in a bundling machine, and the stacks are transferred to the storage area within the 155- by 600-ft. board-plant building. Shipments, even those going to outlets in the Seattle area, all go by rail, as the spur track runs directly into the structure.

The machine shop, maintenance equipment, and employees' change-house are under one roof in a separate building near the plant office. A feature of the change-house is the noticeable absence of the usual tiers

Loading at San Marcos. From the stockpile the material is again gravity-fed to a conveyor which carries it to the ship through a loading chute. There it is distributed to the various holds by the vessel's distributing machinery.

The "Lundeberg" has a carrying capacity of more than 10,000 tons of rock, and can make 17 knots.

The steamship "Harry Lundeberg" in port at Long Beach. The vessel, specially designed to load and unload gypsum rock, is 470 ft. long and carries a crew of 40.

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Steel Available
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25th

Perlite, used in board products, is popped in this furnace from sized ore right in the Seattle plant.

The unloading boom conveyor from ship to shore. Dust-arresting devices on the "Lundeberg" make the unloading a dust-free operation.

of lockers; instead, wire baskets with hanging hooks for clothing are attached to chains over pulleys, allowing them to be pulled up to the ceiling and out of the way. The lowering and lifting chains can be padlocked by each workman. This system saves considerable floor space, since about 165 men are employed at the Seattle plant.

By the autumn of 1956, Kaiser Gypsum should be able to boast a combined production capacity from all its plants of about 600,000,000 ft. of board, and more than 100,000 tons of plaster products annually.

As production zooms, the need for increasing tonnages of crude gypsum likewise mounts, so the quarries and crushing plants on San Marcos Island in the Gulf of California have continued to expand progressively to meet the soaring demand. Considering the possibility of total output in the various plants doubling present capacity within a year, the company is now preparing to expand and improve still further the efficiency of its quarrying, crushing, storage, and transportation facilities on the island.

San Marcos Island lies southeast of the town of Santa Rosalia in Baja California, and about 1,200 water miles from the nearest Kaiser gypsum plant at Long Beach. Nearly a quarter-billion tons of the high-grade crude gypsum remains available for quarrying, and little or no stripping is required. Mining is by the open-quarry method, and the rock is crushed to minus 4-in. size at the island deposit. The present surge pile storage capacity of 20,000 tons or so will probably be doubled during 1956, as will the crushing plant output, drilling and blasting schedules, and the transportation and loading systems.

Whether it be disaster by fire, such as the one which gutted the Redwood City plant, or shipwreck, like that of February, 1954, when Kaiser Gypsum's principal ore carrier was lost on the rocks off Cape San Lucas, the company wastes little time in replacing destroyed property. Loss of the *S.S. Harry Lundeberg* (fortunately all hands aboard were rescued) created an immediate need for chartering another coastwise cargo carrier to keep the stream of crude gypsum flowing northward to the processing plants. As soon as this was accomplished, company officials set about acquiring another vessel, equipping and outfitting it with the latest high-capacity loading and unloading equipment. Also christened the *Harry Lundeberg*, the new ship went into gypsum-carrying service early in 1955 under the command of Captain D. R. Coppock.

Manned by a crew of 40, the new *Lundeberg*, 470 ft. long and 66 ft. abeam, has a carrying capacity of more than 10,000 tons of rock in her hold. Her oil-fired 8500-hp. steam turbine drives the ship at 17 knots. A shoreside spout on the vessel receives the rock from a loading conveyor at the dock at San Marcos. A pan-feeder deposits it on a shuttle belt which distributes the cargo into self-cleaning hoppers forming the hold.

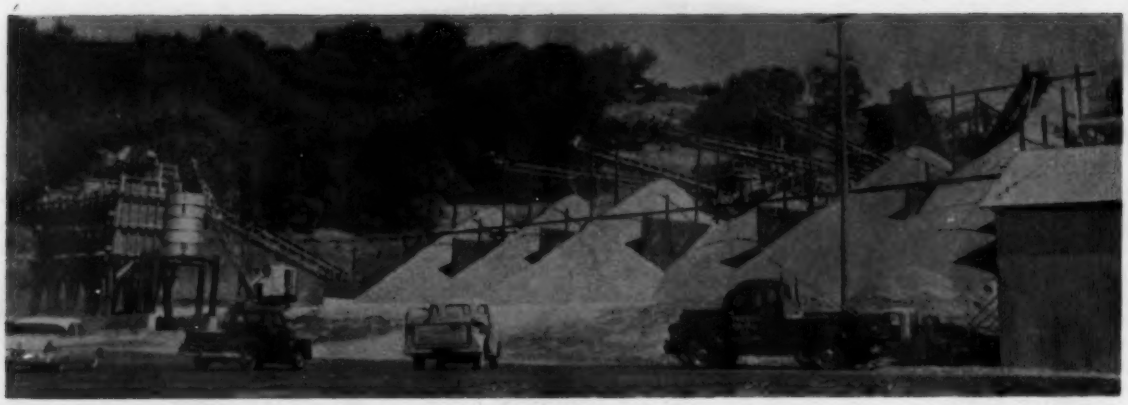
During unloading at the plants, reclaiming conveyors in tunnels beneath the hoppers are fed by gates, and the belts discharge to the boot of a huge bucket elevator at the forward end of the ship. This elevator feeds to a long boom conveyor, swung over the side at the bow, to transfer the rock, *via* a dustless lowering spout, to the conveying system and thence to the raw storage buildings at the rate of 700 t.p.h. Bag-type arrestors collect any dust arising from the unloading operations.

In-port time is less than a day, for loading or unloading, and the ship makes the run from San Marcos Island to Long Beach in three days. The trip from the island to Seattle requires about six days.

Although the new *Lundeberg* has yet to complete her first anniversary in service, naval architects are already poring over plans for a still newer, larger, faster ship to help satisfy the clamorous demand of the new Kaiser gypsum plants for more and more rock!

Crude gypsum was originally carried by the dual bulk-cement and/or gypsum-rock carrier *S.S. Permanente Silverbow*. But an imperative need for her services exclusively as a cement transporter plying between the West Coast and Permanente warehouses in Honolulu, Alaska, and other ports of the Pacific by the parent concern, Permanente Cement Company, has reduced the *Silverbow's* availability as a gypsum carrier in recent years.

General offices of Kaiser Gypsum Company are in the Kaiser Building at 1924 Broadway in Oakland. Henry J. Kaiser is president of both Kaiser Gypsum and the Permanente Cement Company. Claude E. Harper is vice-president and general manager of Kaiser Gypsum; John V. Pooler is general production manager; and Colin L. Campbell is general sales manager. Plant superintendents are Sam Witt Jr. at Seattle; Ernest Schaper at Antioch; and John O. Lewis at Long Beach.



Finished material at the plant of the Marin Rock and Asphalt Company is stored in piles above a recovery tunnel. At the left are the truck-loading bunkers and the slurried-material silo. Mixer was just being installed by the crane when the photograph was taken.

California Plant Produces Slurried Road Base Material

Another ON THE SPOT Report

PRODUCTION of so-called "slurried road-base material" has come to the fore during the last year in California. A number of pit-and-quarry operators, particularly in the San Francisco area, have been turning out this unwashed crusher-run product which carries an added 6 percent or so of moisture to aid compaction. It saves the road builder a good deal of time and the expense of wetting and blading the cushioning course before rolling or otherwise compacting it ahead of the actual paving operations. Naturally, it commands a premium price.

Most producers use an arrangement of fine sprays at the truck-loading bins to prepare the slurried base mixtures. At the new plant of the Marin Rock & Asphalt Company at Novato, Calif., however, the base-rock mix is wetted uniformly by passing it through a steel cylindrical mixer similar to a short scrubber. It is then discharged into a water-tight steel silo alongside the conventional material bunkers. A bottom gate in the silo unloads the pre-wetted product by gravity directly into trucks for delivery to the road job.

The Marin plant was re-located at its present site early in 1955. Formerly known as the Marin Gravel Company, it had been processing sand and gravel at Point Reyes, about 25 miles west of the present deposit. The new deposit at Novata, however, consists of a bluish rock occurring in the prehistoric Sonoma lava flow. It is being quarried on 20-ft. benches. After drilling and blasting, a Lima 1½-cu. yd. diesel shovel loads International dump trucks (about 8-ton capacity) for delivery to the plant hopper, a haul of only about 300 ft. at the present time.

The primary processing station, located at the hopper, consists of a Symons 4- by 8-ft. rod-deck scalping screen followed by a Birdsboro-Buchanan 40- by 60-in. jaw crusher. Minus ½-in. screen throughs, composed largely of overburden fines, are wasted; and a 70-ft. inclined conveyor builds up a primary-crusher surge pile of 1,500 tons' live-storage capacity to supply the plant proper.

After recovery by tunnel conveyor beneath the surge pile, the stone is carried to the sizing and recrushing station. This includes two Symons horizontal vibrating screens and two Telsmith Gyrasphere crushers, one a 4-ft. and the other a 3-ft. unit, in closed circuit. The final product, a 100 percent crushed material, is separated into six sizes—1½ to 1 in.; 1 to ¾ in.; ¾ to ½ in.; ½ to ⅜ in.; ⅜ to ¼ in., and minus No. 4.

Each of the six sized products is fed by pant-leg chutes from the screens to six stacker conveyors which build up storage piles ar-

(*Continued on page* 126)

Below, left: This view shows one of the gyratory fine crushers and pant-leg chutes from sizing screen feeding the stacker conveyors.

Below right: The inclined transfer conveyor from the recovery tunnel belt to the truck-loading bins.

See article on Pacific Coast Aggregates crushed stone plant, page 125 of this issue.

DON'T OVERPAY YOUR TAXES*

WHETHER the federal income tax rates are cut or not, you may be able to cut your own tax bill—honestly! To do this you need to know the tax effect of various choices. Your choice of a method of handling a particular transaction can raise or lower your taxes, and sometimes you can save money by a legitimate shift of taxable income or deductions from one year to another. You are also allowed choices in your treatment of certain items in your tax return, such as depreciation and research costs.

Many businesses could reduce their tax burden if they were aware of the tax considerations affecting a variety of transactions. The most feasible means for many businesses to keep alert to tax saving opportunities is frequent consultation with a properly qualified advisor. If the firm retains a certified public accountant or a firm of C.P.A.s, there should be tax consultations not just once a year when the filing date approaches, but throughout the year as decisions are made which will affect the tax.

Choice of Depreciation Method Certain tax-saving steps are still possible at tax-filing time. One of them is the proper choice of a depreciation method. The first step is to determine the estimated useful life of any asset acquired during the tax year. Every businessman should have a copy of Bulletin F, which contains tables of "average" useful lives. It is available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 30 cents. These tables provide a guide, but it is not necessary to follow them exactly.

The simplest method is straight-line depreciation. It may also be the best in your particular case. Just divide the cost (less what you expect to sell it or trade it in for when it is replaced) by the number of years of estimated useful life, and this is the amount to be deducted each year. In arriving at the original cost, don't forget to include freight and installation charges in addition to the price paid for the equipment.

The law now specifically permits several other methods of depreciation for new assets having a useful life of three years or more. One of them is known as the "declining balance" method. In the first year the depreciation rate is twice what it would be under the straight-line method. The next year the same rate is applied to the amount remaining to be depreciated. This process is repeated each year. The result is that a greater proportion of the cost is depreciated during the early years of the life of the asset.

Another new method, known as "sum of the years' digits", has a similar effect. Figure depreciation on a new asset in all possible ways, so that you can decide which is best for you; then make the proper choice.

These methods of rapid depreciation may be particularly helpful to a company which is currently making large outlays for new equipment, but the depreciation left for the later years of the asset's life will be less than under the straight-line method. The best method depends upon the circumstances of the individual company. Moreover, the choice is affected by such imponderables as estimates of future earnings and tax rates during the life of the asset.

Research and Development Another choice confronting the taxpayer is to determine whether to treat research and development costs as immediately deductible expenses or to amortize them over a period of years. The immediate deduction is certainly a "bird in the hand", and may be very attractive to a company which needs this tax benefit to help finance the undertaking.

A concern which can afford to spread the cost over the estimated useful life (or at least 60 months if the useful life cannot be determined) may find it best to do so. This is especially likely to be advantageous for companies whose income is expected to increase.

Being Taxed as a Corporation There is a provision in the 1954 Internal Revenue Code which allows some proprietorships and partnerships to be taxed as if they were corporations. This choice should not be made lightly, as there is considerable uncertainty about the provision, and the proprietorship or partnership desiring corporate tax treatment might find it better actually to incorporate.

Choice of Fiscal Year Regulations now permit changes of fiscal year in some cases without permission of the Treasury Department. Generally it is wise to use the fiscal year which corresponds most nearly with the annual cycle of business operations, ending at the low point of receivables, inventories and loans, instead of a calendar year. This reduces the area of possible dispute over such matters as value of inventories, and has many advantages apart from tax considerations. The change should be carefully timed, however, to avoid possible adverse tax effects during the time of the changeover period.

Sickness and Accident Benefits Under the present tax law, payments from your company to employees for treatment of sickness or injury are not taxed as income of the employees. If the company has a plan for continuing all or part of an employee's pay while he is absent for sickness or injury, limited amounts of this "sick pay" are also tax exempt.

This applies whether the payments are made by the company or by an insurance company. In the case of a sickness requiring hospitalization even for one day during the course of the illness, or in the case of *any* injury, the first $100 per week of payments are tax free. In the case of sickness which does not require as much as a day's hospitalization, the exemption begins after the first week of absence.

No great formality is required concerning the "plan" but it should be explained to employees, and appropriate records should be kept of the amounts paid. Proposed regulations governing tax withholding in 1956 from payments to ill employees were still under discussion when this article was prepared.

Repairs and Improvements If you contract for repairs and improvements to your business property, be sure that these two types of work are billed separately. Should you lump them together, you may find that the entire cost has to be capitalized for future depreciation. By listing the cost of repairs as a separate item you are

(*Continued on page* 180)

* This article is based on information supplied by the American Institute of Accountants, the national professional organization of certified public accountants.

McLANAHAN EQUIPMENT

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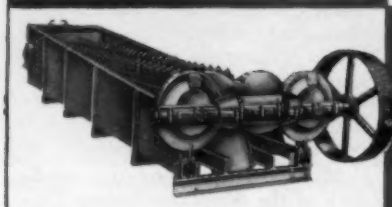
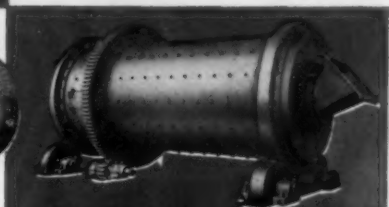
FEEDING, CRUSHING, CLEANING in
...TS, MINES and QUARRIES

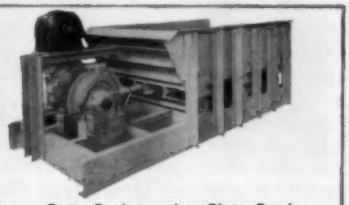
A pioneer in the development of many types of processing equipment, McLanahan has served domestic and foreign pits, mines and quarries for more than a century. Shown on this page are a few illustrations of McLanahan equipment for crushing, washing, sizing and conveying all types of ore, coal and rock. Technical details and price information will be sent upon request.



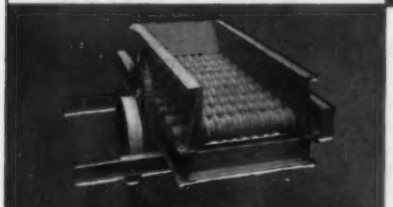
Log Washer for removing tough clay and soft rock from various materials.



Steel Paddle Mill Scrubber—high capacity for cleaning large size feed.

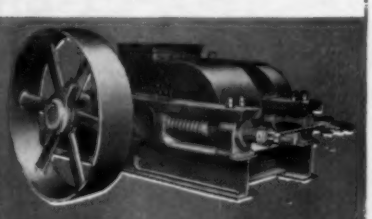


Heavy Duty Reciprocating Plate Feeder. Handles any material from sand sizes to shovel loaded rock and ore.

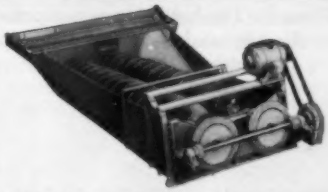


Low mill capacity for sizing and feeding various products.

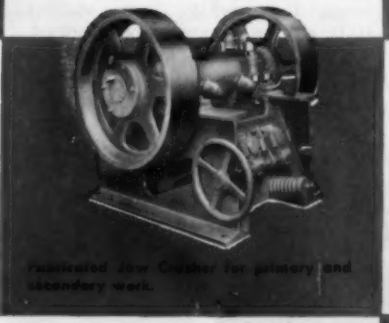
Double duty combination Scrubber and Sizing Screen for large and small capacities.



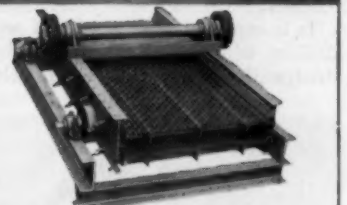
Heavy Duty Fabricated Double Roll Crusher for secondary reduction of rock and ore.



Double Screw Washer (with gear cover removed), for removal of waste and water from sand and similar materials.



Fabricated Jaw Crusher for primary and secondary work.



Single and Double Deck Vibrating Screens in different sizes.

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Iowa Producer Straightens River To Obtain New Gravel Deposit

another ON THE SPOT report

JUST over a year ago, the Flint Crushed Gravel Company of Des Moines, Iowa, completed and placed in operation its new sand and gravel plant near Tama, Iowa. On the southern outskirts of town and just west of U.S. highway 63, the plant was built practically from "scratch" to handle a new deposit. The latter adjoins the depleted area in which the company had previously operated for several years.

Material in the old workings was exhausted by November, 1953, shortly after the start of construction at the new site in October of that year. During the development of the new property, Nature was given an "assist" and a face lifting. In its original course, the Iowa River had made a southerly horseshoe bend through the area now being excavated. After obtaining a dredging permit from the state, the company dug a new and straighter channel for the river. In so doing, the local drainage was improved, and from 80 to 100 acres between the new channel and the old was made available for dredging operations.

The old stream bed is now almost dry except for the present dredge area, which is primarily supplied by ground water. Only at seasonal high river levels does any back-water flow in the old river bed, and then it raises the level of the dredging lake by only about one foot.

It is expected from results of test drilling in the area ahead of the dredge that the deposit will yield material containing about 25 to 30 percent of plus ¼-in. gravel. Dredging up to the present, however, has revealed the usual characteristics of stream deposition which result from changes in water velocities. As the river had enlarged its bend over the years, the area on the outer perimeter, where the velocity was low enough for the water to drop its load of finer sediments, was constantly increased. It is through this area that recent operations are being carried forward, and as a result the present percentage of sand is somewhat higher than will probably be recovered further on.

However, the processing plant, which was built by the local crew under the supervision of John Vore, plant superintendent, has encountered no difficulty in producing material which will meet state specifications for all concrete aggregates.

The deposit, averaging about 40 ft. in depth, is being worked by a dredge with a 7-in. pitch chain mounted on a 40-ft. digging ladder. An 8- by 8-in. Amsco Nagle Swintek pump furnishes the raw feed from the dredge to the plant through a 340-ft. length of 8-in. Armco pipe. The pump is driven by a 250-hp. G-E electric motor with a 12-stage control for adjustment of suction and pumping rate. After each swing across the working face, another 10-ft. section of pump line is added.

At the top of the plant the pump discharge, about 50 tons of solids per hour, is received in an old circular pump shell. Mr. Vore conceived this arrangement for provision of a velocity breaker prior to flow into the 6- by 6-ft. steel pump box mounted immediately below. From the pump box, the raw material falls onto a 46-in. by 9-ft. 6-in. triple-deck Simplicity vibrating screen equipped with spray bars. Ludlow-Saylor screencloth is used on this unit, and screen openings on the top, middle, and bottom decks are 1½, ¾-, and ¼-in. respectively. Mr. Vore states that he has found appreciably longer screencloth life and saving of bottom deck cloth by installing a ¾-in. screen on the middle deck, thus preventing an excess of coarse material from falling on the finer screen.

Top-deck oversize (plus 1½-in.) is chuted to a Cedarapids 16- by 18-in. Universal jaw crusher, where it is reduced through a jaw setting of 1¼ in. This crusher product is then raised by a 44-ft. bucket elevator and discharged into an 8- by 20-ft. Eagle Iron Works twin log washer driven by a 60-hp. G-E motor.

Material retained on the middle deck of the Simplicity (minus 1½-, plus ¾-in.) is chuted direct to the log washer. This is also true of the minus ¾-, plus ¼-in. sizes retained on the bottom deck. All gravel processed through the log washer, which is supplied with water at 100 g.p.m., is discharged to a 2- by 6-ft. triple-deck Kolman sizing screen mounted in tandem with, and directly below the high end of the preceding unit. Material is washed on all three decks of the Kolman screen.

Plus 1¼-in. gravel from the top deck is returned to the Cedarapids jaw crusher for further reduction. From the crusher it is again elevated to the log washer, thus completing

(*Continued on page* 180)

Gravel is processed through this crusher, screen, and logwasher at the Flint Crushed Gravel Company.

A 340-ft., 8-in. pipeline carries the raw feed from the dredge to the processing plant.

BETTER FRAGMENTATION produced by new Akremite process permits stripping units to move 25% more material.

Blasting Costs Cut 50%, Stripping 25% More Efficient, with New Akremite Method

Spencer prilled Ammonium Nitrate is key ingredient in new "make-it-yourself" explosive

By F. M. Robertson, Supt., DeBardeleben Coal Corporation

During one year of testing Akremite, the new "make-it-yourself" explosive, we of the DeBardeleben Coal Corporation at Sipsey, Alabama, have had the following experiences:

(1) We can cut blasting costs as much as 50%. (2) Better fragmentation permits stripping units to move 25% more materials per hour. (3) A dramatic series of tests has proved that Akremite is one of the safest possible explosives.

This simple but revolutionary new explosive is the brainchild of R. L. Akre, superintendent of drilling at Maumee Collieries Co., Terre Haute, Ind., using prilled Ammonium Nitrate produced by Spencer Chemical Company.

Ammonium nitrate by itself is not an explosive. But it was Akre's idea to mix ammonium nitrate with carbon black and pack it in a polyethylene bag. When the bag is confined in a drill hole and detonated with a high gelatin dynamite and primacord, it produces a tremendous explosion. Because the mixing operation is so simple and safe, it can be done right at the mine location.

To find out how safe Akremite actually is, we asked Southern Research Institute at Birmingham to put the new explosive through a series of tests. The testers fired bullets into bags of freshly made Akremite. They also conducted the regular pendulum-friction and modified propagation-through-air tests.

No explosions, fire, or crackling resulted from any of these tests, although the rifle-bullet impact test on dynamite produced four violent explosions out of four trials.

Simpler, safer, cheaper, better, Akremite is fast becoming the favorite explosive for strip mining.

(NOTE: Spencer Chemical Company will be happy to provide you with further information about the Akremite Method as discussed by Mr. Robertson.)

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New Drilling Equipment Developed By British Anhydrite Mining Firm

another P/Q exclusive

HOW to save manual effort and at the same time increase productivity is a problem which the owners of Imperial Chemical Industries Limited have been tackling in recent years in connection with their anhydrite mine at Billingham, England. The result has been an exten-

By JOHN GRINDROD
B.A. (Com.)

The new roomote-control, electrically-operated drill carriage used in the anhydrite mine of Imperial Chemical Industries at Billingham, England.

sive scheme of modernization and mechanization, particularly in the development of an electric rotary drill carriage, which is in many ways revolutionary in British mining practice.

For many years, one of the activities of the extensive complex of factories belonging to I.C.I. at Billingham, known as the Billingham Division, has been the mining of anhydrite for use in the production of sulphuric acid and in fertilizer manufacture. In view of the world shortage of raw sulphur, the erection of an additional plant at Billingham was authorized in 1951 to make sulphuric acid for commercial purposes, using anhydrite as the raw material and producing cement as a by-product.

The output of these products has increased enormously and has called for greater and greater quantities of anhydrite as the raw material. This rapidly increasing demand, together with the need for the best possible working conditions, has spurred recent developments at the anhydrite mine, which extends over a vast area 800 ft. below the Billingham plant. The 1½ square miles of workings are being extended at the rate of an acre a week.

In contrast to the conditions in 1927, when the mine was first worked by pick-and-shovel methods, the material is now loaded by the largest and heaviest types of Joy loaders into 150-hp. self-tipping diesel trucks, which are replacing underground rail haulage and which carry the anhydrite along bulldozer-cleared roadways to a full-sized rock crushing plant housed in a 90-ft. pit below the mine floor. Air-conditioned workshops for the maintenance and servicing of mining machines and tools are lighted by fluorescent tubes. Personnel facilities include modern washrooms, showers, lockers, etc., and a canteen equipped for motion pictures.

But the development of the electric rotary drill carriage, which is the result of four year sof designing, construction, and trial, is one of the most radical technical changes brought about at Billingham.

Drilling, blasting, and handling of anhydrite, especially by percussive methods, caused dense clouds of dust, which cannot be suppressed with water because of the setting properties of the fines. The dust, although harmless, not only makes working conditions unpleasant, but it calls for special precautions in equipment design to prevent the packing and locking of bearings and lubricated moving parts.

To counter this difficulty, I.C.I. decided to develop an electric rotary drill for the preparation of shotholes. This, in itself, is nothing new, but the carriage, which had special requirements, embodies a number of interesting features.

Among the main points in the original specifications were these requirements: that the carriage should mount two drills, each capable of exerting a maximum thrust of one ton into the rock face; that the carriage and drills should be capable of being operated by one man; that from one position it should be possible to drill all the holes on a face 24 ft. wide by 18 ft. high; that it should be capable of drilling parallel with the floor at a maximum height of 22 ft.; and that it should operate on average gradients of 1 in 19 and maximum gradients of 1 in 8. Shotholes were to be 1⅜ in. in diameter and up to 10 ft. long.

As there was no equipment on the market that could be modified to meet these requirements, I.C.I. engineers, in co-operation with Hardy Pick Limited, of Sheffield, developed a drilling machine using a suitable tungsten carbide drill bit and having a remote-control system.

As completed and first used in the mine, the carriage was on crawler tracks, but it was found more satisfactory to mount the equipment on a tired chassis. One drill mounting is being converted, so that it can operate on a 1 in 4 gradient. The fitting of tires instead of tracks has increased the overall height of the prototype equipment by 18 in., but this will be compensated for in later machines.

The carriage is mounted on a 3-axle AEC Mammoth Major chassis 8 ft. wide and having a wheelbase just over 11 ft. 8 in. The chassis has an articulated rear bogie with drive to both axles and is powered by an 11.3 liter diesel engine downrated from 150 b.hp. to 100 b.hp. at 1,800 r.p.m. to insure that neat diesel exhaust fumes do not contain more than 1,000 p.p.m. of oxides of nitrogen or 2,000 p.p.m. of carbon monoxide under full load conditions.

A 5-speed gear box, in conjunction with a 10⅓ to 1 differential and 11 × 20 14-ply tires, gives a maximum

The hydraulically-elevated, wheeled crane, with the platform lowered.

road speed of 21 m.p.h. at a gross loading of 24 tons. In use, speeds are limited to 10 m.p.h. As measured at the outer front wheel, a turning cycle approximately 50 ft. in diameter gives ample maneuverability.

Together, the chassis and drilling equipment actually weigh about 19 tons. Each jib is mounted on a turntable and is telescopic. Powered by two single-acting rams 4¾ in. in diameter, which give 220 degrees of rotation, the turntable is welded to the sole plate of a sub-frame and the whole is bolted to the vehicle chassis.

Double-acting 4¾-in. diameter rams permit the jib, which is fabricated from aluminum sections, to be raised through 90 degrees. Each jib is made in halves, so that the drill rests inside the jib for drilling holes on the jib center line. Each half of the jib houses a 2-in. diameter double-acting ram, by means of which the jib is extended or retracted, while hydraulic rams pivot the drill frame about its trunnions at the front of the jib.

The drill frame is made up of 2- by 2- by 3/16-in. angle members, which form the corners and carry the front and rear castings, tied at intervals by aluminum alloy bar bulkheads and stiffened by angle diagonals between the bulkheads. The frame top is made from perforated ⅛-in. plate, and the bottom is of solid ⅛-in. plate.

Mounted on trunnions at the front of the jib, the drill unit is driven by a 5-hp. totally-enclosed electric motor on the underside of the drill frame. The rotor shaft is extended to the rear to drive a Plessey hydraulic pump, while the front extension engages a 2-stage epicyclic reduction gearbox with a ratio of 26 to 1. From the gearbox a chain transmits the drive direct to one of two feed screws which are coupled together by a gear train. Drill rotation is up to the rate of about 140 r.p.m., penetration then being at the rate of 13.5 in. per minute for a hole of 1⅜-in. diameter and between 8 and 10 ft. long. Between these distances holes can be driven to pre-selected lengths in 6-in. stages. This is governed by a number of Londex type-QO switches which are arranged on the drill frame and which operate in retraction gear.

To facilitate drilling and to prevent the drill rod from binding in the hole, two feeler rams, each consisting of a hydraulic cylinder with a circular claw attached to the nose of the piston rod, are mounted on each side of the drills. These give the jib a preload of 1⅓ tons or about 3,000 lb. As the thrust of the drill itself increases, with its tendency to deflect the jib, a device reduces the pressure in the feelers to hold it to the initial 3,000 lb.

For drilling anhydrite a pressure of between 800 and 3,000 lb. is needed at the bit, depending on its sharpness. Pressure beyond the 3,000-lb. figure carries with it the risk of shattering the bit. Normally, bits are removed for regrinding when they demand a thrust of 2,240 lb.

To determine the most economical rate of penetration, consideration has to be given to the frequency of bit changing on the two drills being operated and to the rate of wear of the bits, depending on the type of rock drilled. Conditions vary from one area to another, and even across the rock face, to such an extent that bit-life may range from 10 to 150 ft. drilling depth in areas only 3 ft. apart. The maximum possible penetration rate has been found, very roughly, to be about 10 in. per 100 r.p.m.; and at this rate the tungsten carbide tips last longest.

The whole drilling operation is successfully carried out by one man, who controls the machine from a portable pushbutton panel which can be held in one hand and which is connected to the equipment by a trailing cable. Duplicate controls are also housed in a box mounted on the chassis. The drills can be used at the same rock face or for drilling simultaneously into opposite rock faces. All movement of the jibs to get them into position for drilling is remote-controlled, and the whole process of drilling and retraction after the pre-set depth has been reached is wholly automatic.

For moving the carriage any distance, the jibs can be brought to rest on a structure over the front of the chassis. Jacks have also been provided on the front of the chassis to prevent movement under certain drilling conditions, but these have been found unnecessary.

The design work of the new drilling equipment was carried out by K. N. Emmott, Chief Engineer's Department, I.C.I. (Billingham Division), in conjunction with the anhydrite mine engineering staff and Hardy Pick Ltd., of Sheffield.

Another unusual machine used in this mine is a pneumatic-tired diesel truck mounting a hydraulically-elevated Jumbo crane, which may be controlled from the platform or the driving position. It is used as a scaler's carriage, and, with a temporary structure added to the platform for mounting pneumatic drills, as a drilling carriage.

It is powered by a Perkins P4 diesel engine developing 94 b.hp. at 1,500 r.p.m. and is manufactured by F. Taylor and Sons, of Pendleton, Manchester.

When used as a drill rig, the unit mounts two Holman SL 10 A machines on Holman light-alloy 6-ft. 4-in. cradles.

In a recent report by H. M. Inspector of Mines, the I.C.I. anhydrite mine's safety record received well-deserved praise, and the management feels that it is one of the safest mines in the world. The mine was recently among the sections in the Billingham Inter-Works Safety Competition to receive bonus awards for completing 200,000 hours worked without a lost-time accident.

Facilities of White's South African Portland Cement Company, Ltd., Lichtenburg, Transvaal, are currently being expanded by the addition of a third kiln.

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205 CRAWLER	½-Yd.	20,000 lbs.	30-foot boom at 10-ft. radius	?
205 ON RUBBER	½-Yd.	30,000 lbs.	25-foot boom at 12-ft. radius	?
304 CRAWLER	¾-Yd.	27,800 lbs.	35-foot boom at 12-ft. radius	?
304 ON RUBBER	¾-Yd.	50,000 lbs.	30-foot boom at 10-ft. radius	?
405 CRAWLER	1-Yd.	40,000 lbs.	40-foot boom at 12-ft. radius	?
605 CRAWLER	1½-Yds.	72,300 lbs.	50-foot boom at 12-ft. radius	?
1005 CRAWLER	2½-Yds.	159,000 lbs.	50-foot boom at 12-ft. radius	?

*Figures available on request—ask your Koehring distributor to see them.

IOWA GRAVEL PRODUCER ERECTS SLACKLINE CABLEWAY SYSTEM

Another ON THE SPOT Report

A LACK of aversion toward physical labor, coupled with a man's willingness to start from "scratch", are qualities on which the development and growth of operations of the Meyer Sand & Gravel Company at Mt. Vernon, Iowa, were based. Without the benefit of a technical background or engineering assistance, and practically singlehanded, Frank Meyer erected a screening plant and installed a cableway for the only slackline-and-bucket recovery system in that part of the state.

On the river bank, just west of the bridge over the Cedar River for state route 261, is a center of activity that represents a seven-year-itch —one that changed the nature of this undertaking from that of producing a few yards of bank run aggregates in 1945 by random hand excavation, to one of better than 40,000 tons of washed material produced in 1952 during the normal 8-month digging season.

While Mr. Meyer refers to himself as a "small" operator, that term does not do justice to either the man or his efforts. True, his annual production has a modest status in relation to the activities of large corporations in the industry, but many of those bigger companies would be hard pressed to keep pace with his record on an individual ton-per-man basis.

Frank Meyer (third from right), who built his plant near Mt. Vernon, Iowa, practically unaided, and his present crew.

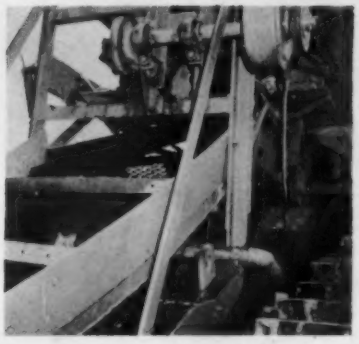
Prior to 1946 the nominal experience Mr. Meyer had gathered in the sand-and-gravel business was confined to hand loading of unprocessed material for small truck-load deliveries when and as ordered by local farmers. This activity was pursued during off hours from his regular employment on a gasoline truck delivery route. In 1946 Mr. Meyer decided to initiate development of a full-time sand-and-gravel enterprise, and therefore acquired a 3½-acre plot along the north bank of the Cedar River adjacent to the highway and a few miles south of Mt. Vernon. A permit was secured from the state that provided for the removal of material from the river bottom over an area approximately one mile long and 600 ft. wide.

The bucket just emerging from the Cedar River prior to being pulled up to the plant for processing.

In 1948 a scraper system of recovery was started to drag material from an island sandbar to the bank. This method was followed until 1952, when a Sauerman slackline rig was acquired and installed to replace the former recovery equipment. With a cableway strung across the river to the opposite bank on an 875-ft. span, an effective digging area over about 600 ft. of the cable length is available. On the far bank the track cable is anchored to a large stump.

Inhaul and tensioning cables—900 ft. by ¾-in. and 500 ft. by ⅝-in., respectively—are controlled by an electric double-drum hoisting mechanism in the control house. The 18- by 24-in. roller-bearing hoist drums are powered by a 40-hp. Western Electric motor. A 70-ft. steel mast, with a concrete base on the bank about 20 ft. above river level, is guyed as a stationary head tower for the 875-ft. by 1¼-in. track cable and the control cables.

Just ahead of the mast, between it and the river, is the screening and washing plant. In lieu of erecting a separate supporting structure for processing equipment and then adding bin storage facilities, Mr. Meyer first erected and joined two 23-ton Bayport steel truck bins and then mounted a grizzly, a screen, and a drag washer above them. This struc-



Above, left: At the end of the track cable the bucket is discharging over the inclined grizzly, which rejects plus 4-in. gravel.

Above, right: All loading out is done directly from stockpiles by two of these loaders, one of which is here working on the washed minus ⅜-in. material.

Left: Six sizes of material ranging from 4-in. to minus ⅛-in. are obtained from this vibrating unit by rotating two sets of two screens each.

ture, from the top of the inclined grizzly to the footings, is approximately 40 ft. high.

During the course of test drilling by highway engineers who were constructing bridge abutments near the company property, it had been determined that bedrock lay from 68 to 72 ft. below normal river level. Since it is possible to wade the full width of the river at almost any point in this area, the depth of recoverable deposit averages about 65 ft. Although the material recovered is variable in size, present digging at a 50-ft. depth in virgin deposit furnishes about 40 percent of plus ¼-in. gravel in the plant feed. Mr. Meyer states that a substantial quantity of good sand is also deposited in his area by seasonal high water. There has therefore been no difficulty in obtaining, without crushing, an ample supply of material which will pass all state specifications for fine aggregates in highway concrete.

An interesting sidelight concerning the deposit is the frequent recovery of plant and animal fossils in the plant feed. A 6-in. section of a mastodon tooth was recently picked out of excavated material by one of the plant crew.

Approximately 40 t.p.h. of material is delivered to the plant by the ¾-cu. yd. Sauerman cableway bucket. It is dumped at the top of the structure on a 6- by 10-ft. inclined grizzly that was fabricated in the company shop with ¾- by 4-in. iron bars spaced 4 in. apart. Grizzly rejects—plus 4-in.—are chuted to a waste pile from which they are sold as fill material, coarse ballast, or for similar uses. Minus 4-in. gravel falls to a Cedarapids 18-in. by 4-ft. plate feeder. This unit feeds the material to a 3- by 6-ft. double-deck Simplicity vibrating screen on which 2-in. (top) and ⅜-in. (bottom) screens are used most frequently.

Top-deck oversize from this unit is chuted directly to one of the two truck bins immediately below, and from there it is loaded out primarily for use as road base material. Spray bars were made by Mr. Meyer and installed over the bottom deck of the screen to wash the minus 2- plus 3-in. sizes retained on that deck. These are then discharged into the other of the two truck bins below and sold as filter gravel.

Bottom-deck throughs are flumed, along with the wash water, to a 24-in. by 16-ft. Universal drag washer. From this drag, the sand is discharged onto the 20-in. belt of a Cedarapids conveyor and carried 68 ft. to a stockpile. This pile is maintained at about 7,000 tons during normal operations. With the 2-in. top and ⅜-in. bottom screens in use, hourly production averages 20 to 25 tons of sand, 10 tons of filter gravel, and 10 tons of fill material.

When mason sand stocks are needed, a ⅝-in. top screen and a ⅛-in. bottom screen are installed on the Simplicity. Material then retained on the bottom deck is sold as blacktop mix sizes. The minus ⅛-in. throughs are processed through the drag washer and then stockpiled. The mason sand thus produced has been delivered to points as far as 50 miles from the plant site.

Three 2-ton International R 164 trucks are used in delivering aggregates. These and customers' trucks are loaded directly from stockpiles by two Hough Payloaders—one a 1-cu. yd. model 53 and the other a 1½-cu. yd. model 55. Loads are weighed out over a 20-ton Fairbanks-Morse truck scale.

Annual production from this compact little plant—which is almost fully automatic—has averaged about 40,000 tons. Operations are in full swing from the middle of March until early December. The remainder of the year is spent in overhaul and general maintenance, in addition to making deliveries from stockpiles. When Mr. Meyer opened the property in 1946, he had, in addition to himself, a "crew" of one. There are now four full-time employees.

This operation, unique in employing the only slackline recovery system in eastern Iowa, is a working example of the spirit in many individual enterprises which collectively form the foundation of an essential industry.

The Italian firm of Ansaldo has begun construction of its new cement plant in Chichiriviche (Falcon State), Venezuela, which is expected to be completed in two years at a cost of $7,500,000. Dock installations are also to be built to handle medium-draught vessels.

Tiger Brand Amerclad in this

Extra flexible welding cable is shown. Fine stranded construction eases strain on operators' wrists.

Notice the flexibility. Tiger Brand is easy to handle.

does the three big jobs high production strip mine

Imagine the worst possible environment for electrical cable, and you'll find it at the strip mine shown in these pictures. The operators are plagued with underground fires, so severe that they have ruined the plastic windows in some of the power shovels. The rocks get so hot that you can't touch them or walk on them.

Despite the heat, the Tiger Brand Amerclad cable lies on the ground day in and day out, delivering dependable power 21¾ hours every day.

They do a lot of blasting at this mine, too. Although they try to protect the cable, it is pounded by large, sharp rocks almost every time there is a blast. Yet, when the pictures were taken, all the original cable was still in use, after *12 solid years of service.*

The mine owners point out that when a cable fails it costs money in down-time and replacement. The clincher is this: every foot of shovel cable, welding cable and drilling cable in the mine is Tiger Brand Amerclad.

Roughhouse service. That cable slung in the air and coiled on the sides of the drills is all Tiger Brand Amerclad.

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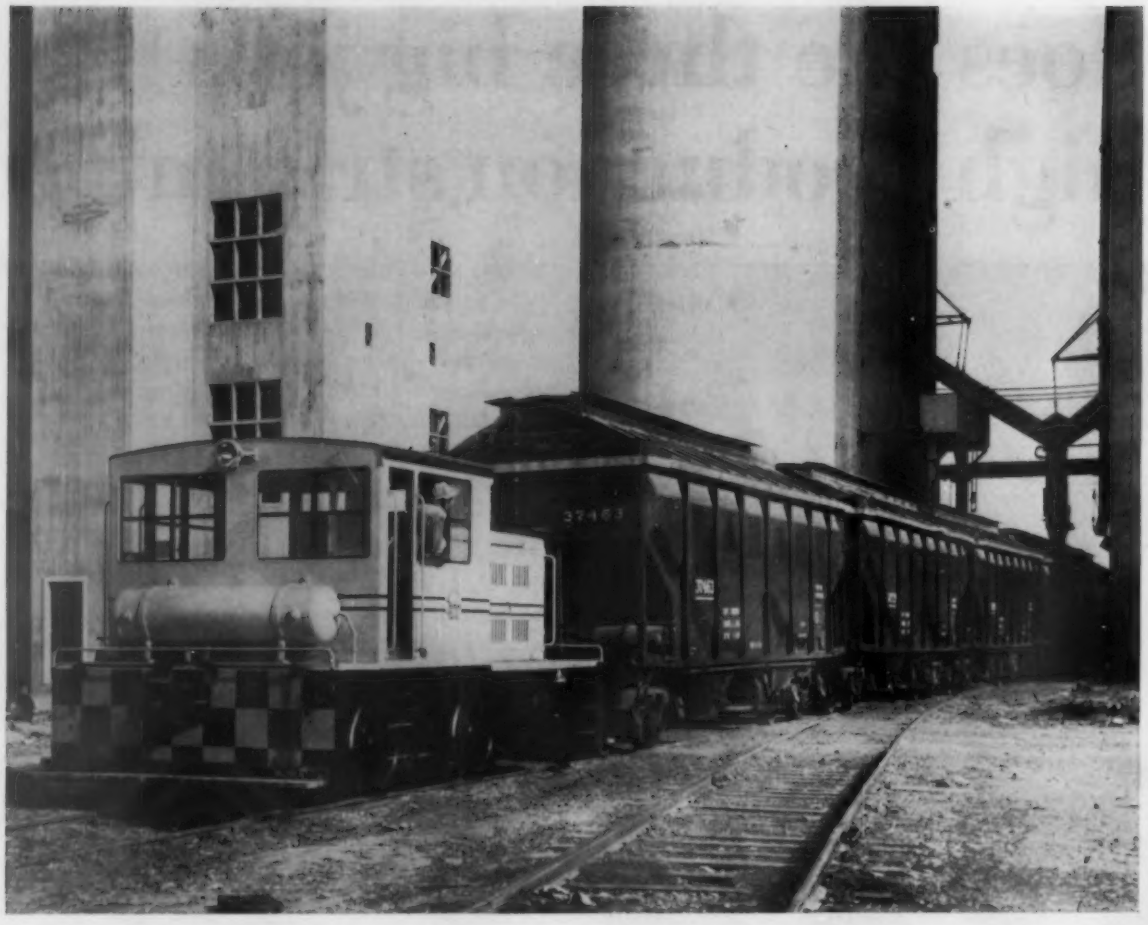

ANDERSON ELEVATOR COMPANY, Maumee, Ohio, reports:

Profits are Fatter since Plymouth cut Handling Costs

"We handle more cars than ever before with our 35-ton Plymouth," says Superintendent Don Bullis. "Plymouth's economy in switching cars for loading, unloading and spotting under the spouts has resulted in big time and money savings.

"Top performance in handling cars one at a time or in strings of forty-five is just part of the story. We've cut time, labor and maintenance costs, and even in hardest use the Plymouth burns only two gallons of fuel per hour. Anderson profits are fatter since Plymouth cut the handling costs."

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PACIFIC COAST AGGREGATES CRUSHED STONE PLANT

Supplies San Francisco Bay Area

By HARRY F. UTLEY

Another ON THE SPOT Report

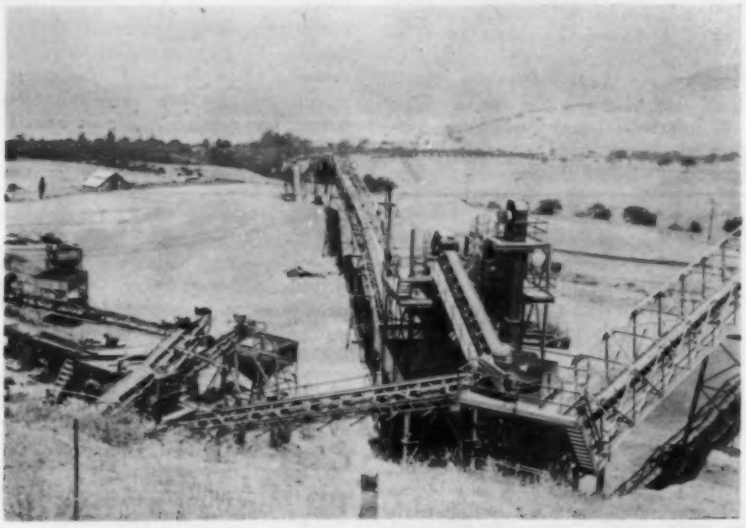
ONE of the most recent additions to the far-flung production facilities owned and operated by Pacific Coast Aggregates, Inc., San Francisco, is its 200-t.p.h. Clayton crushed-stone plant.

The quarry and plant, located near the lower slopes of Mt. Diablo in booming Contra Costa County across San Francisco Bay, was acquired from Harrison & Birdwell in 1954 to provide Pacific Coast Aggregates with a cross-bay source of state specification road material. Upon its acquisition by the San Francisco firm, the entire plant was re-designed, then rebuilt and enlarged under the direction of George F. Hampton, chief engineer.

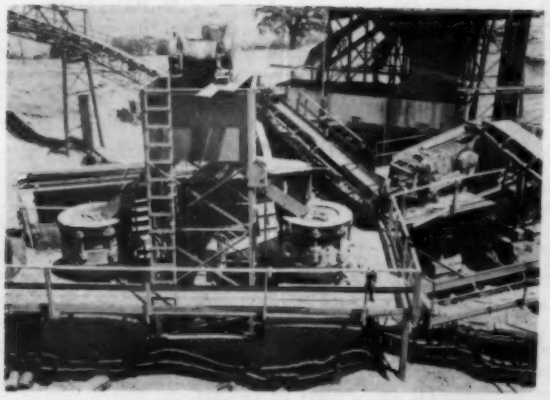
The quarried rock is a Franciscan sandstone (sp. gr. 2.89) and the former high face is now being developed for future benching at 60-ft. levels. Blast holes are driven with Ingersoll-Rand wagon drills, and the material, after shooting, is loaded by a Bucyrus-Erie 38B 1½-cu. yd. shovel into quarry trucks for the half-mile downgrade haul to the plant location.

Loads are discharged into a side-hill hopper and fed by a 42-in. by 10-ft. Cedarapids apron feeder over a grizzly to a No. 2540 Cedarapids jaw crusher; a short conveyor carries the product to a Seco 4- by 12-ft. scalping screen. Rejects are conveyed for further reduction to a Telsmith 3-ft. coarse-bowl Gyrasphere crusher, followed by a similar reduction machine fitted with a fine bowl. All the crushed product at this stage eventually arrives at another Seco 4- by 12-ft. screen, a point at which any or all of the material may be diverted to a stacker belt which builds up a storage pile of crusher-run-base rock; or the screen throughs may pass to a Bodinson 5- by 12-ft. double-deck screen for sizing.

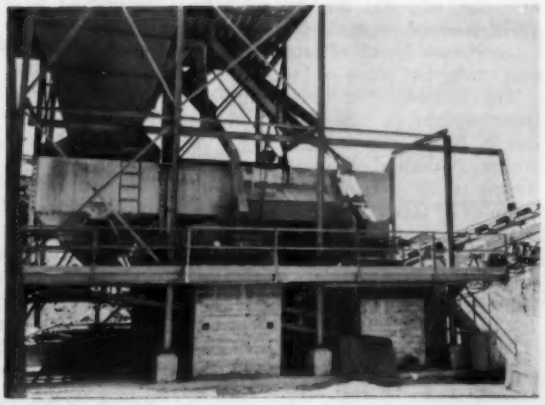
The Bodinson screen classifies the prepared material into three final products: 1½ to ¾ in.; ¾ to ½ in.; and minus ½ in. down to dust. In the event, however, that more of the



Left: A partial view of the Clayton plant, seen from a point near the hopper where the quarry trucks discharge.



Below, left: Two spherical-head crushers, one fitted with a fine bowl, are fed from the two-compartment surge box immediately above.



Below: The third-stage crushing station, which was recently completed and placed in service. In the foreground are three surge bins arranged in line over the stockpiling conveyor leading off to the right.

Looking beneath the crusher-run base stacker conveyor toward the truck hopper and the primary jaw crusher.

The conveyor leading from the recovery tunnel feeds road material into the three truck-loading bins by way of the selective chutes shown.

finer (minus ¾ in.) material is desired, top-deck rejects are subject to further reduction by another pair of crushers installed in the plant's circuit early in 1955—a Symons 3-ft. cone, and a set of 16- by 30-in. rolls —closed-circuited with an Allis-Chalmers 4- by 14-ft. screen.

The three sized products of the operation are initially collected in three steel surge bins arranged in line over the tail end of a 3-section, 400-ft. long belt conveyor which builds up three ground-storage piles over an 8- by 300-ft. recovery tunnel. The tunnel belt delivers either straight-run or blended material to three circular conical-bottom truck-loading bins from which the outgoing trucks are loaded.

One of these truck bunkers has been especially equipped to prepare a "slurried" road-base material which requires no pre-wetting or blading before it is compacted into place on the job. This particular bunker bin has a reverse cone spreader fitted into the conical bottom section to allow the rock to slide in a circular pattern to the loading gate. A perforated pipe encircling the spreader cone sprays water under 125-lb. pressure into the descending material, so that it is thoroughly and uniformly wetted before it discharges into the waiting truck. The conical sections are rubber lined to resist abrasive wear as the wet product slides to the gate.

All switches in the entire plant are interlocked and pushbutton-controlled. Water, used primarily in the above-mentioned slurry bunker, since all material is processed in a natural, dry state, comes from a reservoir located high up on a nearby hill.

James K. Ross is superintendent of the new Clayton plant. Don B. Piper has general supervision of Pacific Coast Aggregates quarry operations, both at Clayton and at a 300-t.p.h. plant turning out similar end products at Brisbane, Calif.

Pacific Coast Aggregates is one of the country's largest producers and currently operates nearly 40 different plants capable of turning out close to 10,000,000 tons annually of sand, gravel, and crushed rock, plus ready-mixed concrete and asphaltic mixtures. These facilities are situated at strategic points throughout central and northern California.

California Plant

(From page 111)

ranged in line over a tunnel. Live storage capacity of each pile, separated by concrete bulkheads, is about 2,500 tons. The recovery belt conveyor operating in the tunnel is reversible, allowing it to deliver to a row of truck-loading bins when running in one direction, or to the bins of a Madsen 1,500-ton asphalt plant when the direction of travel is reversed. Belt feeders beneath the tunnel gates serving the piles of finer-size material are powered by variable-speed motor drives, so that an accurate blend of stone can be sent to the hot plant or bunkers.

The truck-loading bins ordinarily store straight sizes of crushed stone, but a blend can be delivered, of course, if desired. Distribution is by means of an overhead shuttle conveyor. The mixer which prepares the slurried base material is located at the far end of this conveyor and above the slurry-storage silo. Mixtures to be slurried are blended onto the tunnel belt to meet specifications. The Bodinson Manufacturing Company of San Francisco built the mixer, a 4- by 8-ft. steel cylinder equipped with lifters and perforated piping inside to introduce the water.

Plant production, practically all unwashed road material, is at the rate of about 125 t.p.h. Marin Rock & Asphalt is headed by Mario Bottini, and Frank D. Brannan is the general manager. Although idle for years, the quarry and deposit now being worked at Novato were originally opened about a century ago in gold-rush days, when Chinese coolies were employed to chisel out blocks of dimension stone for use in early California structures.

Commerce, Labor Departments Forecast Rise in Construction

New construction expenditures may reach a record-breaking total of $44,000,000,000 in 1956, 5 percent above the $42,000,000,000 peak indicated for 1955, according to estimates prepared jointly by the U. S. Commerce and Labor Departments. Substantial gains are anticipated in private non-residential and public construction. New housing, although slightly below this year's volume, is expected to continue at a high level.

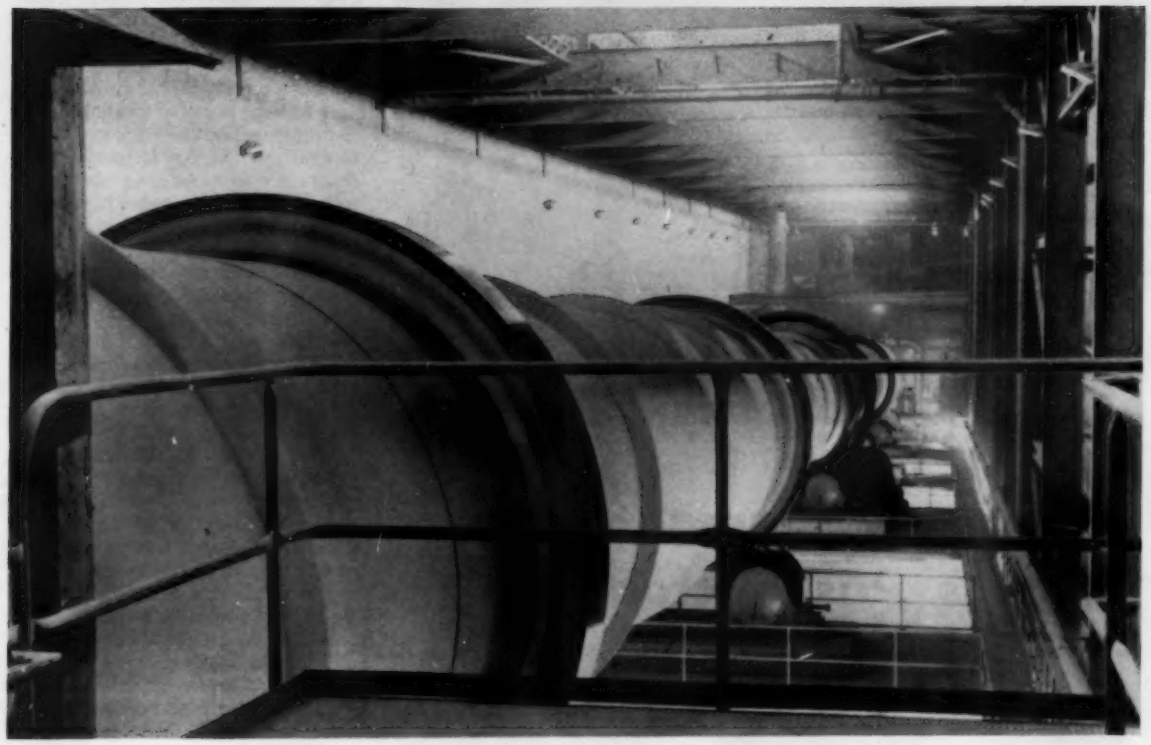
Private construction outlays in 1956 are set by these departments at slightly above the 1955 total of $30,000,000,000. Public construction, which in recent years has increased steadily, although more slowly than private work, is expected to rise 10 percent in 1956 to more than $13,000,000,000.

The value of private non-farm residential construction was predicted to remain near the 1955 level of over $16,000,000,000. Most of the increase in private construction between 1955 and 1956 is anticipated from the rise in expenditures for new non-residential building to $8,700,000,000.

Commenting on the overall construction picture, spokesmen for the two departments forecast an increase of about 10 percent over 1955 expenditures, with gains in all major categories.

The Fond du Lac Stone Company, Fond du Lac, Wis., recently installed a Pioneer crushing and screening plant which is able to break down rocks measuring up to 42 by 36 in. into five small sizes, from 1½-in. to less than ⅛-in. The plant was installed by the Drott Tractor Company of Detroit.

Profitable trends in the use of refractories



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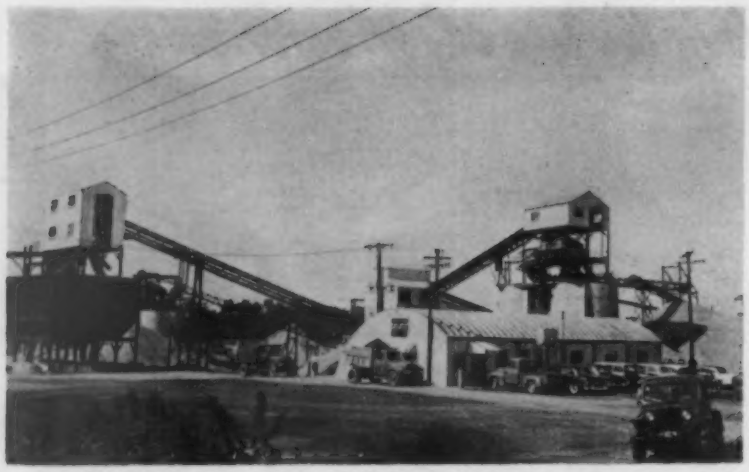


This view at American Aggregates Company's new plant shows the 2-lane truck bin (left) supplied by the reclaiming conveyor, the crusher house (center background), and the pea gravel silo behind the office (right).

American Aggregates Corp. Opens Pushbutton Plant

By BUREN C. HEROD

Another ON THE SPOT Report

IN order to serve the growing areas of construction in and around northern Indianapolis, and that section of Marion County, Ind., American Aggregates Corporation, Greenville, Ohio, constructed a new $500,000 sand and gravel plant on the northern outskirts of the Indiana capital. Construction of the Templeton plant was initiated in March, 1954, when it became evident that the new plant's "older sister", the South Indianapolis operation which has been supplying that area since 1928, could no longer meet the growing demand. Increasing length of truck haul from the latter plant to the constantly expanding northern areas, along with associated problems of traffic and longer on-the-road time, were also contributory to the decision to erect a new operation. By December 15 of last year, sufficient pogress had been made to initiate test runs, and on March 1 of this year regular production was started.

This modern pushbutton plant was designed to produce a large tonnage of 18 sizes with a compact set-up. Flexible in nature, it allows the separate or simultaneous production of material for concrete or bituminous aggregates—the former generally uncrushed, and the latter crushed —and also allows blending of the two when this is desired. Efficient planning of plant layout has provided not only for separation of sand and gravel processing, but also for stockpiling of finished material from these two separate operations over the length of a reclaiming tunnel which serves both. Crushed or round gravel may also be transferred laterally from the crusher building to a stockpile area on the opposite side of the plant from the reclaiming tunnel.

The deposit, which N. R. Garrison, plant manager, states has a good blend of large and small sizes, is expected to provide about a 15-year reserve at the proposed annual production rate of 50,000 tons. Present production approximates 18,000 tons per week on a one-shift-per-day basis. It is estimated that with the 24-hour-per-day operation, the plant would put out 35,000 tons wer week.

During the construction period a 2-cu. yd. Bucyrus-Erie 50B dragline, powered by a 275-hp. Cummins diesel, was brought to the future digging area to strip overburden and open a dredge cut. A 16-in. dredge was then brought in from the Raymond St. (S. Indianapolis) operation, erected at the site, and launched in the cut.

The company-made dredge has a 65-ft. digging ladder with an 18-in. suction line and a cutter head that will take up to 12-in. stone. A 16-in. Amsco centrifugal pump (with a 600-hp. Westinghouse motor) pumps the material through a 16-in. Armco

These two screens in the new plant have ball compartment bottom decks which prevent screen blinding.

One of the three 14-ft., 6-in. sand drags and the settling tanks below the sand plant. The raw gravel feed belt from the desander is at the left.

pipeline back over the stripped area to the desanding plant. A 50-ft. section of pipe is added in each pass across the dredging area.

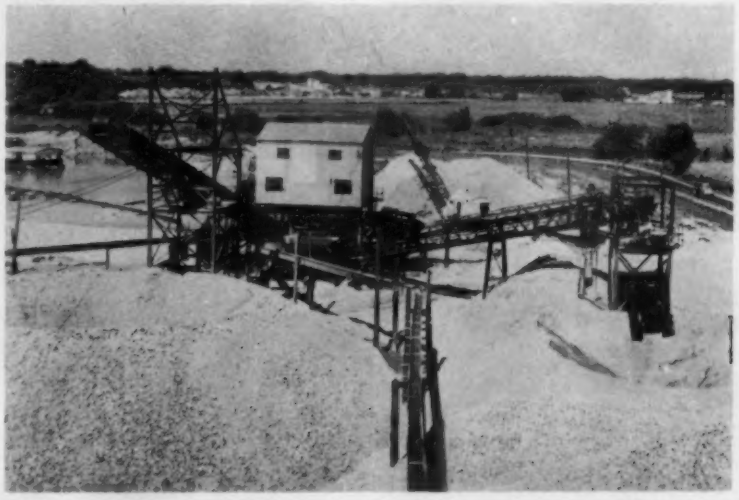
When a 1,600-ft. length of line has been installed, a booster pump will be added. Swing lines from dredge to shore are handled by a D6 Caterpillar tractor. The dredge is currently supplying about 4,000 tons over the 10-hr. night shift.

The desander, where the dredge line discharges, is almost an operating trademark of this company. In locating this unit close to the dredging area, provision was made to remove sand for separate processing before the raw feed reaches the gravel plant, or to reject it into the depleted dredging area in lieu of having it accumulate around the processing plant.

At the desander, the dredge discharge is taken over a company-made 3/16-in. slotted coal bar grizzly. Oversize flows directly to a 6- by 12-ft. Allis-Chalmers Ripl-Flo double-deck screen for final desanding and dewatering. From the 1¼-in. opening top screen, and the ⅜-in. bottom screen, retained gravel is chuted to a stacker conveyor. On the 30-in. belt of this unit, it is carried 167 ft. to the raw gravel storage pile from which the gravel plant is fed.

Grizzly throughs (minus 3/16-in.) and desander bottom-deck throughs (minus ⅜-in.) are pumped to a 10-in. Armco pipeline to the top of the adjacent sand plant by a 10-in. Nagle pump with 75-hp. G-E motor. They are then fed to two 5- by 12-ft. double-deck Allis-Chalmers Ripl-Flo screens with ball compartment bottom decks whose bouncing action

The desanding plant (left) feeds the sand plant (metal siding structure) and the raw-feed conveyor (center). Below the conveyor is the 16,000-ton feed pile for the gravl plant.



This view illustrates, in part, the parallel layout of processing and storage. On the left is the gravel plant feed pile; on the right are the sand and first gravel stockpiles over the reclaiming tunnel.

Below, left: A view of the stone screen which sizes the scalper and crusher discharge in the crusher building.

Below, right: One of the screens over the pea gravel silo. This unit also feeds round gravel stockpiles over the reclaiming tunnel.

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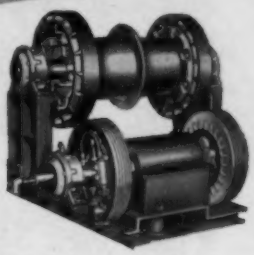

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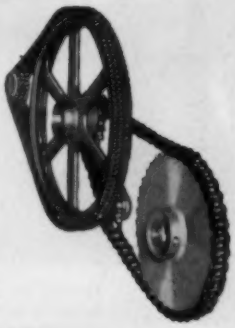

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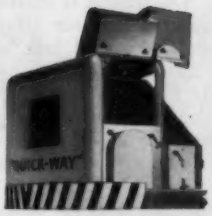

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A part of the crushed gravel from the crusher house (right) is washed and sized on the screen above this silo. Note the three boom conveyors which establish "cloverleaf" stockpiles.

Through the openings visible in the floor this swiveling feed chute can supply appropriate compartments of the truck-loading bin below.

prevents blinding of the screen.

Top-deck oversize (minus 3/8-in. plus 3/16-in.) from these two screens are chuted to the raw-gravel stacker conveyor, where it joins the desander oversize. Material retained on the bottom deck (minus 3/16- plus 1/16-in. "grit") is conveyed 122 ft. on a 30-in. belt from the sand plant to a stockpile over a reclaiming tunnel.

The mason sand—minus 1/16-in. —passing the bottom decks is flumed to two company-designed and plant-fabricated circular sand drags. These units are 14 ft. 6 in. OD and have a 100-t.p.h. capacity at 2 r.p.m. Coarser sizes produced are conveyed by a belt to a junction tower above the reclaiming tunnel, from which point this mason sand can be placed in either of two piles—one being dawn upon while the other is being filled. Overflow with fines from the two coarse drags is pumped to a third drag (of the same size) by a 3-in. Nagle pump. The latter drag operates at 1½ r.p.m. and produces the finest size, which is then removed by the mason sand belt to the junction tower. Each of the three of these sand processing units is driven by a 5-hp. motor.

Beneath the 16,000-ton raw gravel pile—of which about 5,000 tons is live storage—a Jeffrey-Traylor 42- by 72-in. magnetic pan feeder discharges the gravel onto a 30-in. belt, 168 ft. on centers, driven by a 50-hp. Allis-Chalmers motor. At the rate of 350 f.p.m., the raw feed is taken to the crusher house.

At this point, it is discharged over a 5- by 10-ft. Allis-Chalmers Ripl-Flo double-deck scalping screen with 4-in. square screen openings on the top deck and 1¼- or 2¼-in. square openings on the bottom screen, depending on the size of material desired. Drive is furnished through Gates V-belts by a 10-hp. Allis-Chalmers motor.

Gravel retained on the top deck of the scalper is fed to an Allis-Chalmers 30- by 18-in. Blake jaw crusher. Bottom deck oversize (minus 4-in. plus 2½ or 1¼-in.) is chuted to a Nordberg Symons 4-ft. short head cone crusher which is set to ¾ in. Discharge from both crushers is conveyed to the stone screen—an Allis-Chalmers 5- by 10-ft. triple-deck Ripl-Flo with 1⅜-in. and ¾-in. square openings in the top and middle decks, respectively, and 3/16- by 1½-in. slots in the bottom screen. Top-deck oversize is chuted back to the short head crusher to close the crushing circuit.

Sizes retained on the middle and bottom decks of the stone screen may be discharged to either of two conveyors. On one, it is carried out of the crusher house for 100 ft. on a 24-in. belt to a steel junction tower. From this tower the "dust filled" sizes are deposited on stockpiles in a clover leaf pattern around the tower base by three 24-in. conveyors emanating from the structure at 90 degrees to each other.

If discharged to the other conveyor, the stone screen product is carried 148 ft. on a 24-in. belt to a washing screen mounted above a concrete silo. Here, also, three 24-in. belt conveyors mounted on the silo discharge the screen's product on stockpiles around the silo base. Approximately 30,000 tons of washed sizes are maintained in these piles.

Bottom-deck throughs (minus 3/16-in.) of the crushing plant stone screen are referred to as "crusher dust"; they constitute one of the three dust filled products conveyed to the steel tower. This "dust" is supplied for ashphalt resurfacing.

Gravel passing the bottom deck of the scalper screen by-passes the crusher circuit and is carried 123 ft. on a 30-in. belt to a pair of Allis-Chalmers 5- by 14-ft. Ripl-Flo screens mounted on two pea gravel silos. Top-deck (plus 1¼-in.), middle-deck (plus ⅝-in.), and bottom-deck (plus ¼-in.) sizes retained are discharged to piles outside of the silo, while pea gravel (bottom-deck throughs), together with the rinse water, is flumed to a 4- by 8-ft. Simplicity screen also mounted on the silos which receive this gravel after dewatering.

All of the foregoing sand and round washed material piles are located over the reclaiming tunnel on the opposite side of the crusher building from the crushed material stockpile area. The tunnel, a 380-ft. long 6- by 6-ft. 6 in. reinforced concrete structure, has 27 draw points, all handled by one man. Some of these points have been equipped with company-designed electric gates. Overlying material is discharged here onto the tunnel conveyor, which carries it on a 30-in. belt, 508-ft. center to center, to the top of the truck-loading bin.

The latter structure—20 ft. high by 42 ft. long and 28 ft. wide—has a 900-ton total capacity in its 11 compartments. At the top the reclaiming conveyor discharges directly to a rotating feed chute, in the case of sand, or to a 4- by 10-ft. double-deck Ripl-Flo shaker in the event gravel is carried. The latter is again rinsed on the shaker and separated over the ¾-in. square opening top screen and ¼-in. square opening bottom screen before

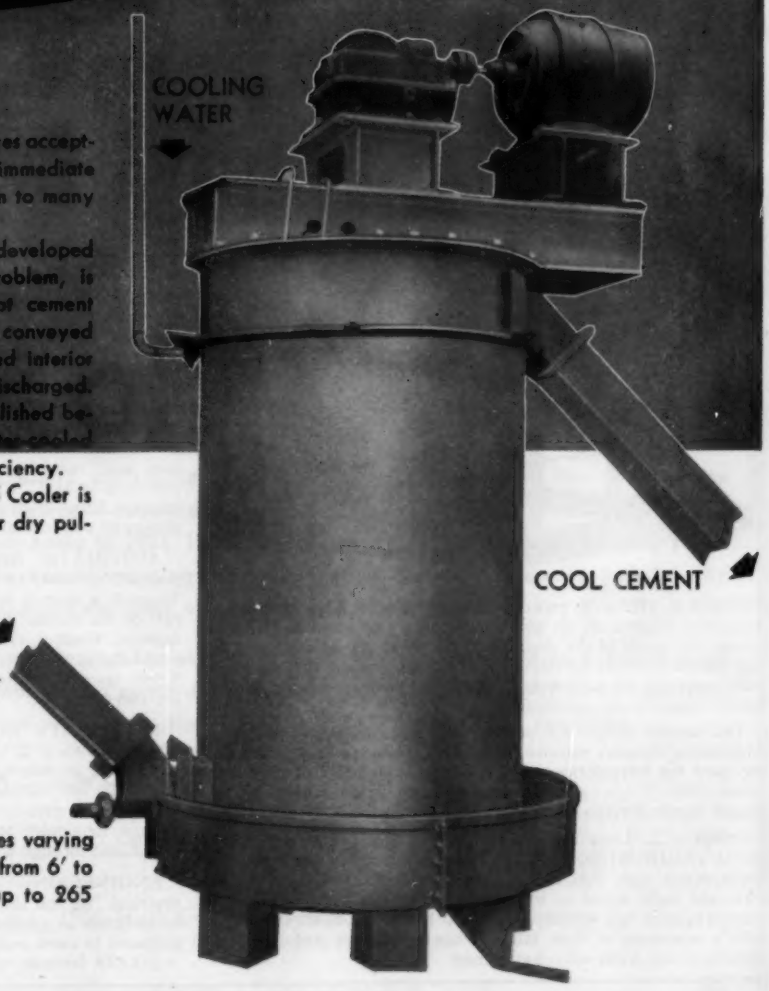
(*Continued on page* 190)

For Cooling Hot Cement

Cooling hot cement to temperatures acceptable for bulk shipment or immediate bagging is an important problem to many cement manufacturers.

The FLS Cement Cooler, developed especially to overcome this problem, is externally water-cooled, the hot cement being introduced at the base and conveyed in a thin layer along the cooled interior surface to the top, where it is discharged. Thus an intimate contact is established between the cement and the water-cooled surface, assuring high cooling efficiency.

In addition to cement, the FLS Cooler is applicable to many other similar dry pulverized materials.



FLS Coolers are furnished in sizes varying from 3′ to 6′6″ in diameter and from 6′ to 18′ in height, with capacities up to 265 barrels of cement per hour.

F. L. Smidth & Co., A/S
Vestergade 33,
Copenhagen K, Denmark

F. L. Smidth & Co.
11 West 42nd Street
New York 36, N. Y.

F. L. Smidth & Co., Ltd.,
105, Piccadilly,
London, W. 1, England

F. L. Smidth & Cie France
80 Rue Taitbout
Paris (9e) France

F. L. Smidth & Co. of Canada, Ltd.
11 West 42nd Street
New York 36, N. Y.

F. L. Smidth & Co. (Bombay) Ltd.
42 Queen's Road
Bombay, India

AIR DEVICES INC.

185 Madison Avenue, New York 16, N. Y.

MUrray Hill 6-2050 — *Representatives in all major cities*

AGITAIR DIRECT-FIRED HOT GAS GENERATING FURNACES

Capacities from 600,000 to 100,000,000 BTU's and larger

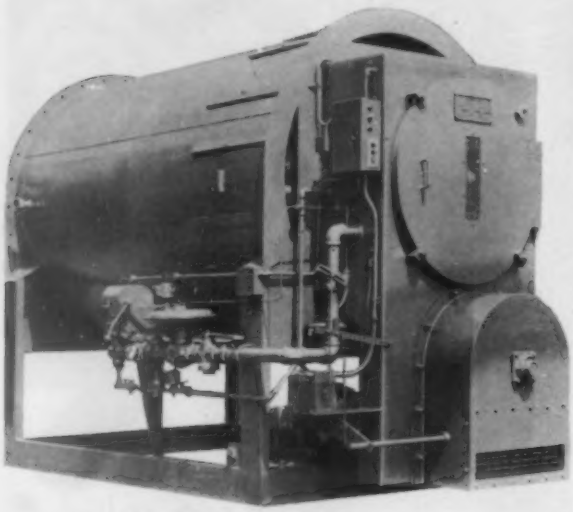
For PROCESS DRYING and PRODUCT HEATING

AGITAIR Furnaces are made in two distinct types, "A" and "AP," in vertical or horizontal units, in a variety of sizes.

Type "A" illustrated is designed for **"pull-through"** induced draft systems with furnace operating under **negative pressure.**

Type "AP" is for **"push through"** forced draft systems with furnace operating under **positive pressure.**

These direct-fired furnaces attain heat releases as high as 500,000 BTU's per cu. ft. of furnace volume.



UNIQUE DESIGN permits the supply of a large volume of secondary combustion air into the secondary combustion chamber to cool the inside of the chamber and insulate its surface from the high temperatures of the flame and combustion gases. The relatively cool tempering air circulating through the annulus cools the outside metal surface of the combustion chamber.

This unique design for cooling the inside and outside of the combustion chamber permits the use of stainless steel and **eliminates the need for refractories** when the furnace exit temperatures are below 1000° F. . . . **permits smaller combustion air blowers . . . lessens motor horsepower . . . lower operating costs.**

COMPACT. Little floor space or head room required; MINIMUM COMBUSTION SPACE reduces refractory lining — less maintenance cost; PACKAGE UNIT with CONTROL PANEL furnished fully wired — light-weight insulating type refractories when required are factory installed. INSTALLATION requires only a minimum of field labor — connections of fuel lines and electric circuit wires only requirement.

APPLICATIONS. AGITAIR Direct-Fired Furnaces are used with SPRAY TOWERS for manufacture of soap and detergents, tannic acid, plastic and food powders; OVENS for baking foods, cores for foundries, finishes on steel sheets; ROTARY and other DRYERS for drying foundry moulds, brick, slurry, cattle and poultry feed, fertilizer, alfalfa, grains; DEHYDRATORS for fruits, vegetables; RAW ROCK and CLAY GRINDING SYSTEMS for drying raw rock for cement mills, pulverized limestone, kaolin and many other products requiring heating or process drying.

AGITAIR Direct-Fired Furnaces are highly efficient heat producing units successfully applied to heating and drying of many products in a variety of industries. These furnaces are built of heavy steel fabrication with combustion chambers designed for high BTU releases. Constructed with high grade heat resisting materials. Design and construction incorporates latest developments in the field of combustion.

OIL OR GAS FIRED. Designed to burn light or pre-heated heavy fuel oils, natural or manufactured gas with manual or automatic ignition. AGITAIR Direct-Fired Furnaces keep cost of fuel to a minimum by utilizing hot combustion gases without chimney or stack losses. Furnaces can also be equipped for a combination of oil or gas firing with one fuel for normal use and the others as a stand by.

DIRECT HEAT CAN BE USED. The AGITAIR method of mixing heated air or recirculated gases with the products of combustion results in a mixture of clean gases at temperatures up to 2000 deg. F. Complete combustion of fuel in combustion chamber is assured by adjusting fuel burner for more excess air than normally used with indirect heating furnaces or boilers. Tempered gases produced at AGITAIR Furnace discharge may be safely applied to material being dried or processed. Direct heat can be used without danger of contamination by soot, smoke or odor.

AUTOMATIC AND SAFETY CONTROLS. Discharge temperature of all AGITAIR Furnaces is automatically controlled. Through a control system which automatically adjusts the firing rate of the burner, fuel input is kept in step with discharged heat demand. Control systems may be operated electrically or pneumatically and comply with National Board of Fire Underwriters. Safety controls to comply with Factory Mutual Group Insurance are also available.

FLEXIBILITY. AGITAIR Furnaces permit operation from full capacity down to 25% of full capacity. Control of the mixed temperature is accomplished by changing fuel input and combustion air supply rate as heat demand varies; hence, a constant furnace discharge temperature is assured. Firing rate may be regulated from a maximum to a minimum (high-low flame), or may be modulated through a range from maximum to minimum flame.

ENGINEERING ASSISTANCE. Air Devices' engineers with practical "on the job" experience in the application of high heat temperature as applied to process drying and product heating, are prepared to assist manufacturers and drying specialists in designing AGITAIR furnaces to meet their requirements.

INITIAL COST. In AGITAIR Direct-Fired Furnaces, products of combustion mixed with heated air are used directly, eliminating elaborate and expensive heat exchanging construction. Units are smaller — air cooled combustion chamber shell eliminates necessity of insulation on outer shell.

INSTALLATION COST. AGITAIR Direct-Fired Furnaces are easy to erect — the cost is a very small fraction of that for indirect fired furnaces — no expensive chimneys required; compact package unit, light in weight due to lesser refractories result in minimum installation cost.

90 TO 95% EFFICIENCY. There are no stack losses from AGITAIR Direct-Fired Furnaces. Virtually all of the heat generated is utilized — air cooled combustion chamber shell reduces radiation losses to a minimum.

FUEL ECONOMY. High efficiency means less fuel required for a given heat output. Low BTU cost.

SPACE REQUIREMENTS. Available in vertical units where floor space is limited . . . horizontal where headroom is a problem.

Review and Forecast

The PIT AND QUARRY field's biggest customer — the construction industry — reached new heights and sustained the nation's entire economy in 1955. It will be even busier in 1956 (and for many years to come) meeting the needs of a growing, dynamic people who demand the best of everything . . . *and get it!*

The demand for the many materials we furnish in such tremendous tonnage to construction and to other industries that serve construction will strain the PIT AND QUARRY industry's facilities.

Our staff reports:

1955 Construction Totals Follow Upward Trend 136
—JAMES G. KOSTKA

1955 Ninth Consecutive Peak Year for Cement Industry 143
—WALTER E. TRAUFFER

Aggregates Output Maintains High Pace 158
—BUREN C. HEROD

Other Nonmetals Show Continued Healthy Growth 166
—BUREN C. HEROD

Special Reports on the Concrete Industries — by Roy L. Peck — feature our CONCRETE MANUFACTURER Section for January 1956

Review and Forecast

Construction

1955 Totals Follow Upward Trend

By JAMES G. KOSTKA

New highs expected in 1956

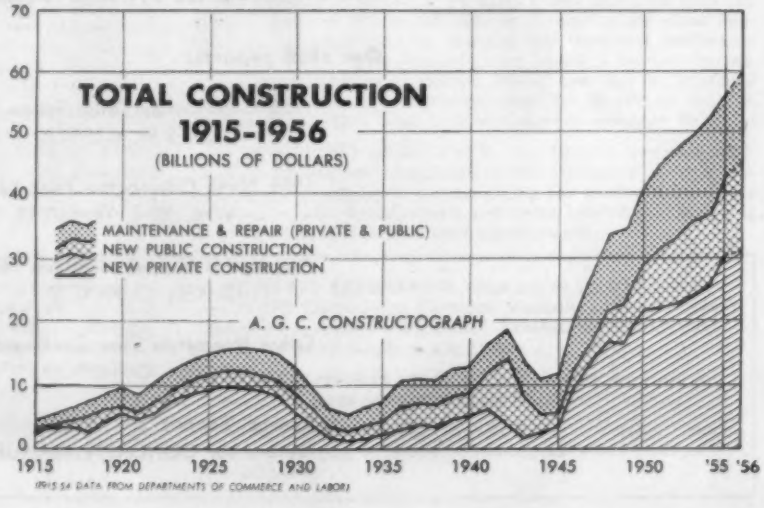
Residential construction, such as the recently constructed Madison Towers Apartment Building in Memphis, Tenn., will consume many thousands of tons of nonmetallic minerals in 1956.

CONSTRUCTION is the heart beat of our national economy. It reflects the pulse of our nation. For ten straight years now, this heart has been pounding at a faster and faster rate, showing practically no signs of fatigue even after the record breaking pace it has been setting. But apparently this accelerated pace isn't fast enough because construction is expected to reach a new all-time high in 1956. And it is more of a probability than a possibility that construction records will be set again in 1957, so this tremendous heart of our economy keeps being stimulated to beat faster and faster to keep up with the ever increasing pace it is being called upon to maintain.

Because construction is such an integral part of our normal life few of us ever stop to consider its importance. Actually, it represents the largest individual expenditure in our present economy. In 1955 new construction alone accounted for about $42 billion, or about 11 percent of the gross national product. Adding an estimated $15 billion for maintenance and repair that took place in 1955 we have a total of $57 billion, or about 15 percent of our gross national product. This represents about 17 percent of the workers currently employed in the United States.

As each new year approaches market analysts, economists, and most everyone else concerned attempt to determine what the construction picture will be for the coming year. Various methods are used to make their predictions. Some plot trends on charts and graphs. Others send questionnaires to producers of construction materials and get their opinions on the outlook for the coming year. And there are still others who use a guesstimate, which is no more than an educated guess and estimate, to come up with their prediction on future construction. Actually, most of these prognosticators come pretty close to making the same forecast; therefore, each method of determining construction for the next year has a certain amount of merit.

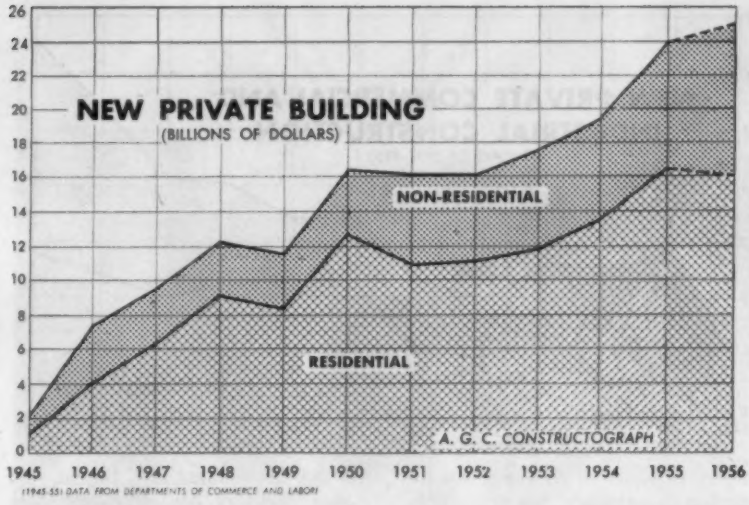
Concensus of opinion is that new construction will again reach a record level in 1956. And the general feeling is that new construction expenditures may reach a total of $44



billion. In addition to this there will be an estimated $15.5 billion spent for maintenance, repair, and remodeling of existing structures and facilities, thereby bringing the estimated total construction up to $59.5 billion in 1956.

The nonmetallic mineral producers will again be called upon to fill the Herculean role of providing sand, gravel, cement, lightweight aggregates, gypsum, lime, asbestos, and many other nonmetallic minerals so vital to the construction industry. Many plants have found out that they are unable to keep up with the ever increasing demands of construction so they are expanding their present plant facilities or are planning to open new plants. This will help them keep pace with current needs, but it is conceivable that further growth through expansion and new plants may become a necessity again by the end of 1956.

A recent survey we conducted in gathering material for our Cement Review in this issue revealed that a number of new cement plants will be constructed by the end of 1956. An even greater number of plants are in the process of expanding their capacities. This should help relieve some of the acute cement shortages that were experienced throughout the country during the peak of the construction period in 1955. An adequate supply of cement must be available before construction demands can be met. The cement in-

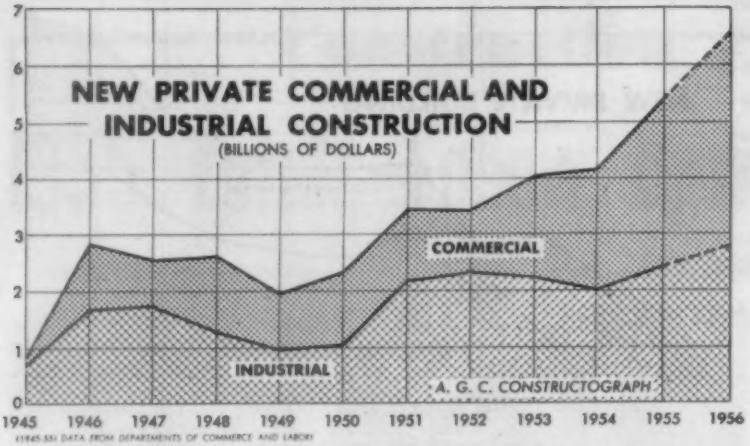


(1945-55 DATA FROM DEPARTMENTS OF COMMERCE AND LABOR)

NEW CONSTRUCTION IN UNITED STATES, 1953-55 AND OUTLOOK FOR 1956[1]
(Value, in millions of dollars)

Type of construction	1953	1954	1955	1956	Percent change, 1955-56
Total new construction	**35,271**	**37,577**	**42,000**	**44,000**	**+ 5**
Private construction	23,877	25,768	30,000	30,850	+ 3
Residential building (nonfarm)	11,930	13,496	16,345	16,200	− 1
New dwelling units	10,555	12,070	14,765	14,300	− 3
Additions and alterations	1,108	1,130	1,250	1,500	+20
Nonhousekeeping	267	296	330	400	+21
Nonresidential building (nonfarm)	5,680	6,250	7,630	8,700	+14
Industrial	2,229	2,030	2,400	2,800	+17
Commercial	1,791	2,212	3,045	3,475	+14
Warehouses, office and loft buildings	739	958	1,125	1,225	+ 9
Stores, restaurants and garages	1,052	1,254	1,920	2,250	+17
Other nonresidential building	1,660	2,008	2,185	2,425	+11
Religious	472	593	740	850	+15
Educational	426	529	500	525	+ 5
Social and recreational	163	228	245	275	+12
Hospital and institutional	317	337	350	350	0
Miscellaneous	282	321	350	425	+21
Farm construction	1,731	1,560	1,400	1,350	− 4
Public utilities	4,416	4,341	4,465	4,450	(2)
Railroads	442	353	340	400	+18
Telephone and telegraph	615	655	700	775	+11
Other public utilities	3,359	3,333	3,425	3,275	− 4
Local transit	30	25	25	25	0
Pipelines	271	300	325	350	+ 8
Electric light and power	1,829	1,900	1,800	1,700	− 6
Gas	1,229	1,108	1,275	1,200	− 6
All other private	120	121	160	150	− 6
Public construction	11,394	11,809	12,000	13,150	+10
Residential building	556	336	250	275	+10
Nonresidential building	4,346	4,641	4,220	4,225	(2)
Industrial	1,771	1,506	705	475	−33
Educational	1,714	2,134	2,450	2,700	+10
Hospital and institutional	365	365	330	275	−17
Other nonresidential building	496	636	735	775	+ 5
Military facilities	1,307	1,030	1,320	1,500	+14
Highways	3,160	3,750	4,100	4,600	+12
Sewer and water	883	982	1,080	1,200	+11
Miscellaneous public-service enterprises	200	218	280	500	+79
Conservation and development	830	704	600	675	+13
All other public	112	148	150	175	+17

[1]Joint estimates of the U. S. Department of Labor and the U. S. Department of Commerce.
[2]Change of less than one-half of 1 percent.



dustry is aware of the need for increased capacity and has taken definite steps to bring their capacity to the level of the anticipated construction demand.

Sand and gravel, crushed stone, lightweight aggregate, ready-mix, concrete masonry, and other plants in the nonmetallic field are also expanding and building so that their production, too, will be geared to the pace set by production requirements.

These plants are cognizant of the demands that have been put upon them so far, and they can foresee even greater demands for next year, so many are planning to increase their capacity so that they may be able to cope with the new demands.

PRIVATE CONSTRUCTION

New Dwelling Units While it is felt that construction as a whole will increase in 1956, most people feel that new dwelling units (nonfarm) will drop. Two of the most prominent authorities on housing statistics, the F. W. Dodge Co. and the U. S. Departments of Labor and Commerce, jointly agree there will be a decline in new dwelling units in 1956, but they are not in full agreement on the rate of decline. The joint estimate of the U. S. Dept. of Commerce and the U. S. Dept. of Labor is that there will be a 3-percent decline in this segment of construction. The F. W. Dodge Co. feels that the drop will be a little more severe. They estimate that nonfarm housing starts are expected to be about 10-percent lower in 1956 than they were in 1955.

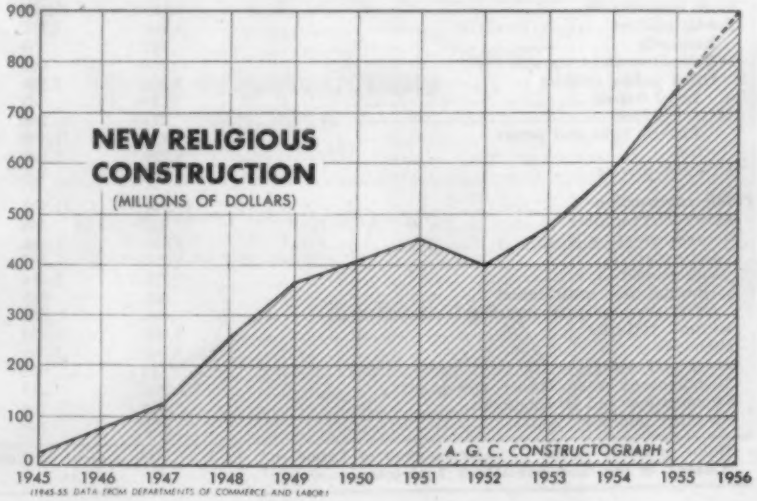
In 1955 F. W. Dodge estimated there were 1,325,000 nonfarm housing starts. In 1956 they estimate these starts will drop to 1,190,000 or an average of slightly less than 100,000 a month. The Bureau of Labor Statistics has estimated that there will be about 1,200,000 starts in 1956 so these two authorities on construction statistics are pretty much in agreement on the estimated starts for this year.

Many factors are involved in the expected dip in new dwelling construction in 1956, such as: tighter mortgage money, higher interest rates on mortgages, higher building costs, higher price of land, a shortage of available land that can be developed at reasonable prices, lack of existing school facilities in newly developed areas, and a number of others.

According to the Federal Housing Commissioner, Norman Mason, the government will ease its housing credit restrictions if home building falls off too much. Home building currently represents a large portion of our total construction. In 1956 it is expected to represent 35 percent of all construction in the United States. This is a sizable segment of our national economy. Because of this fact, tightening the mortgage purse strings too tight could easily lead to a sudden and general decline in business; or loosening them too much could bring on uncontrolled inflation. Therefore, the money being loaned for dwelling construction has to be controlled so that a suitable balance can be maintained in our national economy.

Another factor, the cost of construction, will tend to slacken buying to a certain extent. Construction costs climbed into new high ground in 1955, despite some weakening in lumber prices. By September of 1955 the Labor Department's Index placed wholesale prices on building materials up 8.4 percent since mid-1954. And further increases have taken place since then. Right now construction costs are the highest they have ever been—and there are no signs that they will weaken in the near future. As long as the cost of materials and wages continue to rise the cost of building a home will rise proportionately.

During recent years people have become more and more suburban minded. This has resulted in a marked movement from the city to suburban areas. As a result of this movement much of the choice property in these areas has been purchased and built upon. Now builders are compelled to buy land that requires more development in these areas. This means that the price of the land will be higher because more work will have to be done to it before it will be suitable for construction purposes. As a result, the prices of development are added to the price of the property, thereby causing the property to become more



expensive than it would have been if development wasn't necessary.

Since most families have children who are of school age they must consider school facilities before they buy or decide to build a home in a suburban area. In many areas that are in the process of development school facilities are woefully lacking, thereby limiting the demand for homes in this area to older families with grown children who have already attended elementary and high school or the very young families whose children have not reached the school age yet.

Even older established suburban areas are confronted with the perplexing problem of furnishing adequate school facilities to the children in their area. These communities have been growing at astounding rates and, as a result, school systems that were more than adequate ten years ago are now far too small to accommodate the recent surge in the enrollment of new pupils.

Currently, two methods of raising money for new schools are in operation in the suburban areas. The first, and most commonly used is to raise taxes. This places the burden on those already living in the community and discourages some new prospective residents from buying or building in the area. The second method of raising funds is to have the contractor contribute a donation to the school fund for each home he builds. This type of contribution averages around $300 per house. Some communities have tried to compell contractors to contribute a set amount for each house they build, but there is a question of legality involved in this type of procedure. In any event, if the contractor contributes or is compelled to contribute to the new school fund, the ultimate purchaser of the home is the one who finally pays the bill because this added expense is more than likely to be added to the price of the house.

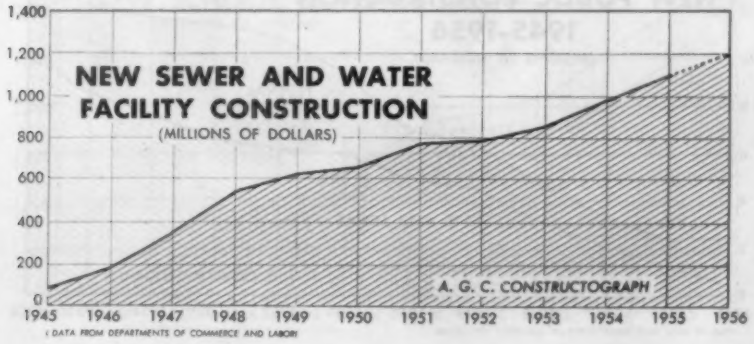
Workmen pouring the second course of portland cement concrete pavement slab on the New Jersey approach to the third tube of the Lincoln Tunnel, linking Weehawken and Manhattan.

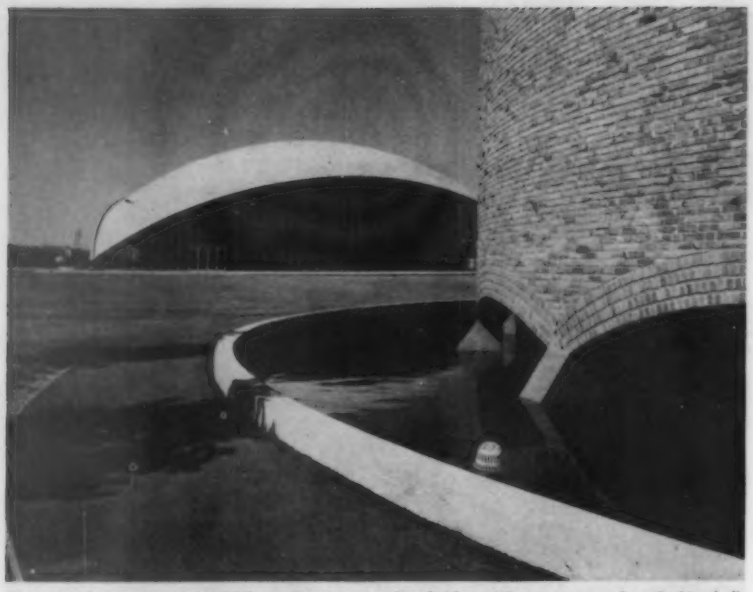
Additions and Alterations The addition and alteration market is a rather nebulous one because there is not the direct check on it that we have on new construction. Many of the smaller jobs are done by do-it-yourself home owners; therefore, the dollar volume of this market has to be estimated. The U. S. Departments of Labor and Commerce estimate that this phase of construction amounted to about $1¼ billion in 1955 and will be an estimated $1½ billion in 1956. This is an increase of 20 percent.

Nonhousekeeping This category includes hotels, dormitories, and such structures as tourist courts, and cabins, and vacation cottages. Our continuing increase in earning power has permitted more people to travel extensively. In order to accommodate this increasing number of travelers and vacationers new facilities have to be built. Structures of this type cost an estimated $330 million in 1955 and are expected to reach about $400 million in 1956, an increase of 21 percent.

Nonresidential Building This group consists of industrial, commercial (warehouses, office and loft buildings, stores, restaurants, and garages), and other nonresidential building (religious, educational, social and recreational, hospital and institutional, and miscellaneous). It is estimated that this group as a whole will account for $8.7 billion of the total construction, or an increase of 14 percent over the $7.6 billion in construction produced by nonresidential building in 1955. With record numbers of people being employed and earning record wages the need for warehouses, offices, loft buildings, stores and restaurants increased proportionately. The population has been increasing too; this coupled with higher wages has tended to put a record number of automobiles and trucks on our highways, thereby increasing the need for garages.

An ever increasing population has also reflected the need for more private religious, educational, social, recreational, hospital, institutional, and miscellaneous construction. The composite total of this group is expected to reach an estimated $2.4 billion in 1956. This is an increase of 11 percent over 1955 which





The recently constructed M.I.T. Auditorium in Cambridge, Mass., was made of thin-shell concrete construction. It is interesting to compare this modern structure with the portion of the moated chapel shown in the foreground.

totaled $2.2 billion in this type of construction.

Farm Construction It is felt that farm construction will follow practically the same pattern new nonfarm dwelling units are predicted to follow in 1956, except that the dip is expected to be slightly greater in the case of farm construction. Forecasters estimate the total farm construction will amount to about $1,350,000,000, a decrease of $50,000,000 from 1955. This would represent the fourth straight year that farm construction has declined. Falling commodity and stock prices and ever increasing mechanization has tended to cause many small farm owners to sell their farms and seek other employment. High land values placed on farms situated around the periphery of large metropolitan areas has caused many farm owners to sell their farms so that they can be subdivided into lots. Many homes that are now in suburban communities are build on land that was a corn or wheat field only a year or two ago. And with this shrinking of farm population farm construction has declined too.

Public Utilities As a whole, public utility construction is expected to remain about the same as it was in 1955. Public utilities were responsible for about $4.5 billion worth of construction in 1955. Utilities that are expected to increase their construction in 1956 are: railroads, telephone and telegraph, and pipelines. Railroads are expected to account for $400 million, an increase of 18 percent; new telephone and telegraph companies will account for about $3.3 billion, an increase of 11 percent; and new pipelines will account for about $350 million, an increase of 8 percent.

Public utilities that are expected to decrease in construction volume in 1956 are: electric light and power, and gas. Their anticipated volumes are $1.7 billion and $1.2 billion respectively. Both represent a drop of about 6 percent.

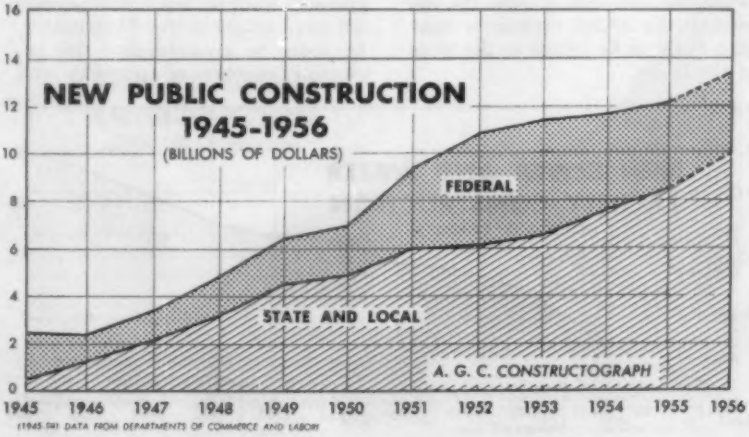
PUBLIC CONSTRUCTION

Forecasts reveal that public construction, as an entire group, expects the greatest increase in volume it has experienced in its last four record breaking years. Construction valued at $13,150,000,000 is predicted for this group in 1956. This is a 10 percent increase in volume over the estimated $12,000,000,000 produced by this same group in 1955. Gains are expected in all of the major categories of this type of construction. During the post-World War II period, state and local governments have been faced with an ever increasing backlog of construction needs despite increasing outlays for new projects. Requirements are especially pressing for highways, schools, and sewer and water facilities. It is estimated that these three types of facilities will account for more than 75 percent of the rise in public construction expenditures in 1956, and each will reach a new record level.

Highways Expenditures for new highways are expected to increase by a half-billion dollars in 1956, bringing the total up to $4.6 billion. This is an increase of 12 percent over the $4.1 billion spent for highway construction in 1955. The motivating factors involved in this expected increase are larger authorizations for federal aid and an anticipated increase in toll road construction during the year of 1956. And although highway construction is expected to reach a new record level, it actually represents only about one-half of the estimated annual requirements during the next ten years.

Although President Eisenhower's proposed road building program suffered a set-back in 1955, it is felt that this program will eventually be passed because it is vitally important to everyone in the United States. The need for more good highways is far too great to scrap this plan completely.

In all probability the original plan to spend $101 billion for road building during the next ten years will have to be revised and modified befor it will be acceptable to Congress.



But there is little doubt that it will be passed in some form because too many voters are concerned with road building to permit this proposed legislation to become a political football.

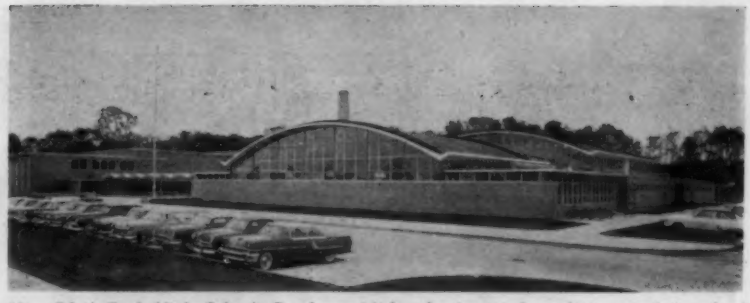
When a road building plan of this magnitude is passed, eventually, we will come much closer to meeting our highway needs.

We are rapidly becoming a nation on wheels. There are now over 72 million drivers of motor vehicles in the United States. And there are 3.3 persons per passenger car registered, or an average of about one car per family. These vehicles traveled 56 billion vehicle miles in 1954, the latest figures available, meaning that each driver traveled an average of 7,800 miles.

Three distinct groups of vehicles travel on our highways. They are: passenger cars, trucks, and buses. In 1954 passenger cars accounted for 450 billion miles of travel; trucks, 106.5 billion miles of travel; and buses, 4.5 billion miles of travel. Each of these groups represents a new record for miles traveled for one year. And it is quite reasonable to assume that new records are again being established by all of these groups in 1955.

In order to cope with this extensive amount of travel, new highways have to be built and old highways have to be maintained. Streets and roads leading into these arterial thoroughfares and those used for local travel also have to be built and repaired.

The Bureau of Public Roads estimates that revenues for highways and streets, combined, amounted to a total of $7,334,000,000 in 1955. The Federal Government will contribute $771,000,000; the state governments will collect $4,779,000,000 in highway-user imposts, toll receipts, and property taxes, bond issues, and general revenues; the local units will collect from the same sources $732,000,000 and $1,052,000,000 respectively.

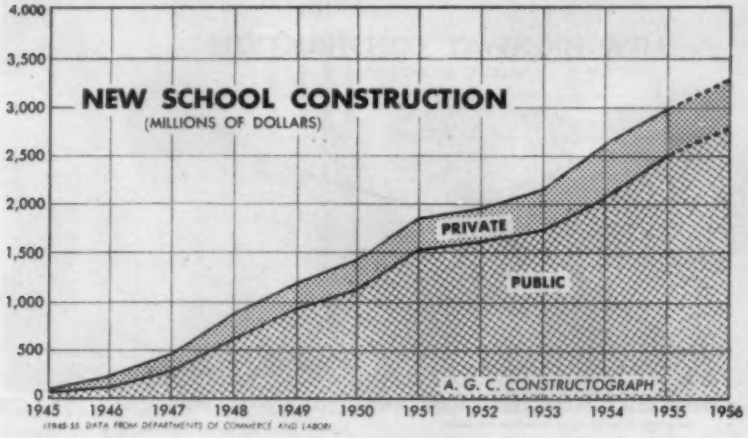


New Edsel Ford High School, Dearborn, Mich., showing modern design used in school buildings today. A 10 percent rise is expected in this type of construction in 1956.

Expenditures for highways and streets in 1955 totaled an estimated $7,552,000,000 of which the state highway departments spent $4,856,000,000; counties, $1,482,000,000; and cities, $1,214,000,000. The total expenditure for 1955 exceeded that of 1954 by a little over 12 percent. And the highway program is expected to continue to increase during the next few years with federal funds and toll receipts showing the greatest percentage increases in the immediate future.

A big portion of the highway construction program involves toll roads. States have found that this type of road provides one of the best means of getting an excellent highway system built, because the indications are that a driver is willing to pay a toll charge if he is assured less congested and more comfortable driving facilities.

Toll roads in operation today total over 1,700 miles, built at a cost of $2,239,000,000. Toll roads under construction total 1,190 miles. The cost of these roads is estimated to be $2,710,000,000. Toll roads authorized or ready to begin construction total 5,600 miles, and will cost an estimated $6,947,000,000. Toll roads projected (in investigational or preliminary planning stage) total 5,310 miles, and estimated to cost $4,261,000,000. This makes the total toll road mileage 13,800 miles for all categories, with an estimated cost of $16,157,000,000.



Educational Public school construction is expected to rise 10 percent in 1956. This will bring the total up to $2.7 billion dollars, and a new record. But even though construction is at a record peak, it will still fall far short of meeting the current needs. Many schools are still overcrowded to the point where two and three shifts are necessary to accommodate all of the children attending these schools. In all probability this situation will be remedied in most cases in the next two or three years. Many communities are initiating school expansion and building programs. But in many cases this will afford only temporary relief. The bumper crop of babies born during World War II will soon be reaching a marriageable age and they too will start having children of their own early in the 1960's. This means that by the middle of the 1960's the schools will again be confronted with the problem of providing adequate facilities for this new group of children who are starting their primary education.

Sewer and Water Even though sewer and water facility construction is expected to reach an unprecedented expenditure of $1.2 billion in 1956, this will come nowhere near filling the current need. The backlog of needs for this type of construction amounts to an average of $2.5 billion dollars for the next ten years. This is more than double the amount expected to be spent for sewer and water construction next year.

Sewer and water facilities haven't kept pace with the tremendous surge of new dwelling units and other con-

Aerial view of the newly-opened 241-mile Ohio Turnpike. This concrete superhighway is now connected with the Pennsylvania Turnpike, and plans are under way for a future link with the Indiana Turnpike. Highway construction will reach a new peak of $4,600,000,000 in 1956.

struction requiring these facilities. One of the main reasons for this lag in construction between sewer and water facilities and residential, commercial and institutional construction is because the money for the two groups of construction comes from different sources. Most residential and commercial construction is purchased with individual capital, whereas sewage and water appropriations have to await voters' approval of a bond issue, plus an allocation of state and federal aid.

Military Facilities Federal spending for military facilities is expected to rise sharply in 1956. Current estimates are that it will reach $1.5 billion this year. The main reasons for this sharp rise are the construction of airfields and related installations of the Air Force, and expansion of naval establishments. The 1956 level of military construction will be higher than it was in any year, except three, and these years were 1918, 1942, and 1943. These are all years during which our country was at war; therefore, the 1956 expenditure will be the largest peacetime expenditure of its kind.

Conservation and Development The year of 1956 is expected to reverse a downward trend that has been experienced by conservation and development work since 1950. The anticipated rise would bring the 1956 total to $675 million, an increase of 13 percent over 1955. The upturn is due, primarily, to work on the St. Lawrence Seaway and increased appropriations to the Corps of Engineers for new flood control and navigation projects and to the Bureau of Reclamation for new irrigation projects.

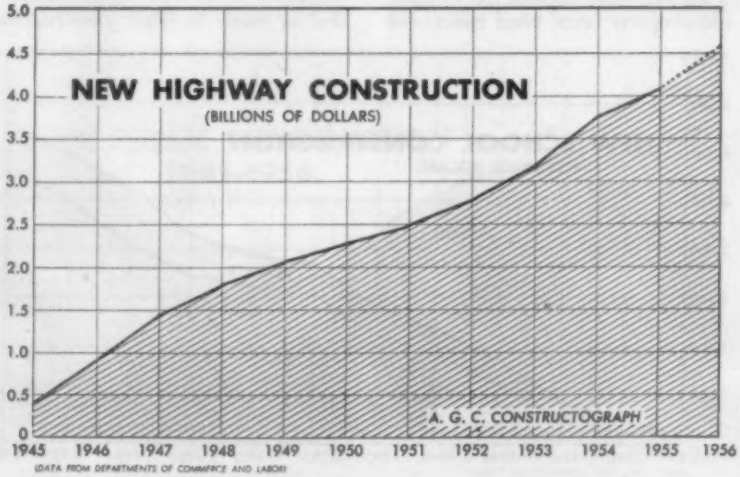
Miscellaneous Public Service Enterprises The half-billion dollars to be spent on miscellaneous public service enterprises in 1956 will be the largest construction expenditure ever made for this group. It will surpass the 1955 record of $280 million by almost 80 percent. Large new power plants on the West Coast, together with power and other facilities in connection with the St. Lawrence Seaway, will be responsible for the unusually large amount spent for this particular type of construction.

Federal, Hospital, Industrial Building The only types of construction for which public spending is expected to decline in 1956 are hospital building. The 33 percent drop in the latter is influenced by the approaching completion of the current program for construction of atomic energy facilities. Hospital and educational construction is expected to fall to $275 million dollars, a drop of 17 percent from the 1955 total of $330 million.

Concrete Pipe Plant Sought By Italian Construction Firm

The Italian construction firm of Flli. Paris, Impresa Costruzioni, S.R.L., is seeking the purchase of a complete plant for the manufacture of centrifugal, precompressed, reinforced concrete pipes.

This firm desires a plant which will produce about 40 meters of 1-meter-diameter pipe per day, to be used in the building of water ducts, sewage installations, and for other similar purposes.



Review and Forecast

Cement

1955 Ninth Consecutive Peak Year

Production, shipments, value reach new levels—vast expansion program under way

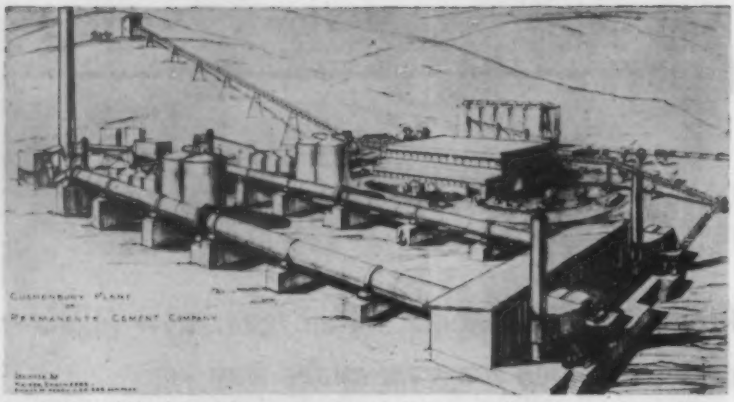
By WALTER E. TRAUFFER

THE portland cement industry in 1955 again, and for the ninth consecutive year, set new all-time records in production, shipments and value, this time apparently by a larger margin than in any other recent year. Official government figures are now available for only the first nine months of the year, but these, backed up with direct information from most of this country's producing capacity, make this a definite fact. The official 10-month figures, with conservative estimates for the last two months of the year, show that 1955 production was about 298,000,000 bbl., shipments about 298,500,000 bbl., and value was about $848,000,000.

This was an increase of about 10 percent in production, 9.2 percent in shipments, and 12 percent in value of shipments over the 1954 record totals of 271,287,000 bbl., 274,096,000 bbl., and $757,570,000, respectively. This remarkable showing was possible only because of the stepped-up efforts of the industry in general to meet the ever-increasing demand by expanding its production facilities at an even more rapid rate than in preceding years. Also as in recent years every effort was made to get maximum capacity from existing facilities, but there is a limit to what can be gained in this direction and the percent of theoretical capacity attained was probably about the same as in the past several years. It was no fault of the industry that the increase in the volume of construction (and the demand for cement) in 1955 far exceeded even the most optimistic estimates with the result that cement shortages were more widespread and severe than in 1954.

The shipments of portland cement through October (10 months) of 1955 totaled 254,017,000 bbl., exceeding the production of 249,003,000 bbl. by 5,014,000 bbl. Stocks on hand at the end of October were 8,073,000 bbl.—1,594,000 bbl. or 19.4 percent less than stocks at the end of October, 1954. The low point in stocks, in October, 1955, was the lowest since the end of October, 1952, and only about 2,405,000 bbl. over the record low of 5,668,000

Artist's drawing of new 1,000,000-bbl. plant of Peerless Cement Corporation under construction near its present plant at Detroit, Mich. Completion is expected in summer of 1956.



New 2,000,000-bbl. plant of Permanente Cement Company under construction near Victorville, Calif. It is expected to be in operation late in 1956.

bbl. at the end of October, 1948.

During 1955 the portland cement industry again operated at a very high percentage of its rated capacity in its all-out effort to keep up with the demand. Government figures show that the industry's productive capacity at the end of 1954 was 294,298,000 bbl. and that production for that year was 271,287,000 bbl., or over 92 percent of year-end capacity at the end of the year. Our own estimates indicate an actual increase in capacity in 1955 of at least 12,000,000 bbl. annually for a total of about 306,000,000 bbl. at the end of the year. With an estimated production of about 298,000,000 bbl. in 1955 this would indicate that about 98 percent of year-end capacity was utilized. This record was achieved in spite of the fact that the record 1955 construction program was slow in getting under way with the result that some plants were forced to curtail output for a time as all available storage was filled.

Other than this there seem to have been no serious handicaps to production in 1955. There were no important strikes and apparently only occasional minor shortages of fuel, labor, materials or equipment. Some delay in the delivery of equipment for plant expansions was reported, however. Some handicaps are expected in 1956 with its greatly accelerated expansion program. Probable shortages of skilled labor, competent supervisors, and of steel and electrical items are expected.

Shortages of cement were apparently more widespread in 1955 than in either of the two preceding years in spite of the stepped up expansion programs in the cement industry. This was because the increase in construction volume far exceeded the most optimistic expectations, including those of the cement manufacturers. In spite of the greatly accelerated expansion program now under way some shortages are expected in 1956, but not in 1957 when the full effect of this expansion will be felt.

The big news of the year was, of course, the change in thinking on the part of cement company executives which induced them to embark on the greatest expansion program in the history of the industry. Almost without exception producers feel that construction volume will continue to increase for many years ahead and few feel that there is any possibility of a recession. The vast increase in highway construction which Congress is sure to authorize is, of course, felt to be a major factor but many feel that even a normal expansion of such construction would insure record construction volume for several years ahead.

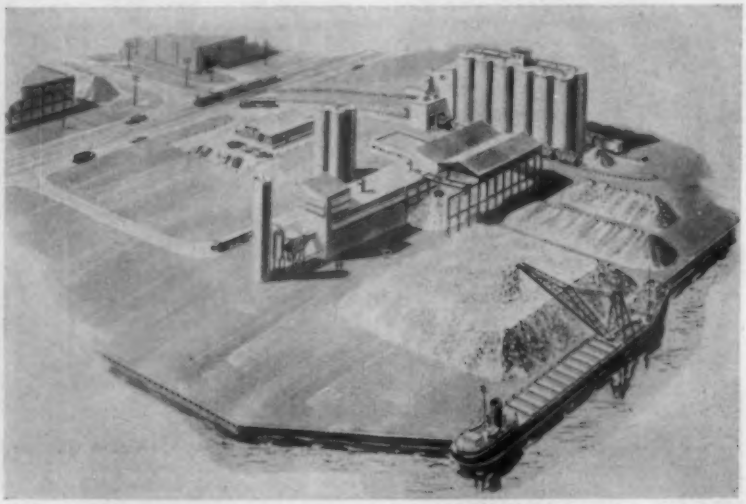
This expansion program involves the construction of at least ten new plants and the expansion of many others for an estimated increase in capacity of over 50,000,000 bbl. annually, most of which will come into production before the end of 1956.

It is impossible at this time to make any accurate forecast of the demand for cement in the year ahead, but all indicators point to a substantial increase. Cement producers, almost without exception, expect to produce and sell considerably more cement than in 1955 and users expect to need more.

NEW ATTITUDE OF PRODUCERS

The letters received from cement companies operating in all parts of this country make it evident that the industry in general has finally become convinced that we are not in a boom period, but that we have reached a new plateau of normalcy based on the rapid growth of this country in recent years. They are now convinced that business may fluctuate upward and downward from this level but is extremely unlikely ever to return to former levels. It is, we believe, the crystallization of this thinking that is largely responsible for the unprecedented new plant and plant expansion program now getting under way.

According to an Eastern producer: "Probably the most important developments and trends during 1955 in the cement industry were a realization that the volume of business we have enjoyed in recent years is not a flash in the pan, and will probably increase; that because of a close balance between supply and demand during the latter months of the summer in each of the recent years, we have prob-



Construction is expected to begin soon on the new 1,250,000-bbl. plant of the Marquette Cement Mfg. Company at Milwaukee, Wis. A combination rotary-grate type kiln will be used.

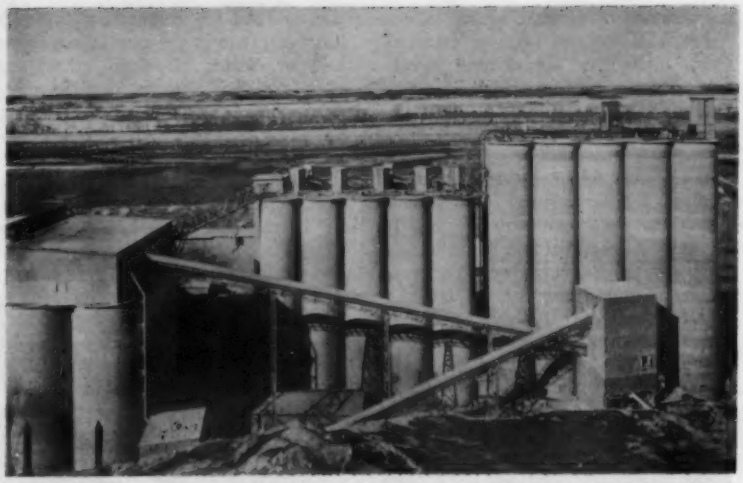
ably lost business to competitive materials on both building and highway work.

"It has become generally recognized, therefore, that substantial increases in capacity must be made in order to maintain a healthy relationship between producer and buyer, as well as to prevent further inroads being made upon our markets by competitive materials."

A Middlewestern producer said: "It is our view that the most important developments and trends during 1955 were the many decisions to increase cement production, which should increase the importance of the industry in the economy of the country."

A producer in the Pacific Northwest said: "We personally feel the most important trend currently among cement manufacturers is their recognition of obsolescence and of the advantages of modernization of factory equipment rather than waiting for it to wear out. Management's willingness as evidenced in 1954, and currently in 1955, to invest heavily in capital equipment proves their confidence in the future. There is a spreading trend to operate production machinery continuously and move bulk cement produced in slack shipping season to outlying terminal storage closer to the customer when he needs cement in the peak season."

According to another Eastern producer: ". . . a substantial program of capacity increase is under way which will probably result in an eased supply and demand situation in 1956, and a totally relieved one in 1957. It may well be that two years from now we will find ourselves confronted with a substantial excess in capacity.

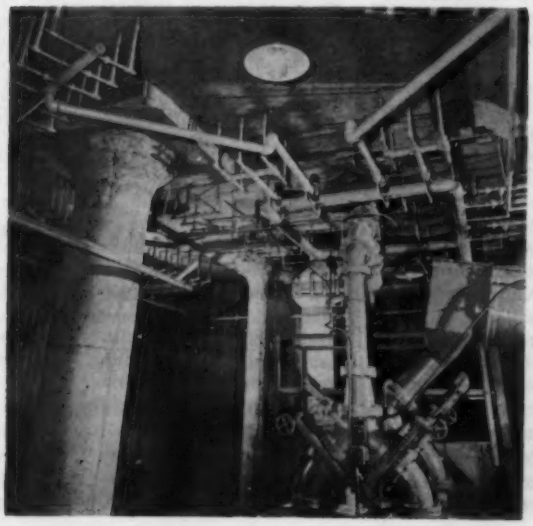


This view at the new plant of the Missouri Portland Cement Company near Independence, Mo., shows two banks of finished cement silos directly behind the crushing department. Raw storage silos are at the left.

"Another significant development in the industry has been the recognition that most plants are obsolete, that ninety pounds of coal and four barrels of production per man hour are not good enough. This has been reflected in a coupling together of plant expansion and modernization. Reconstruction of our plants and the building of a few new plants has brought home the fact that return to owners of cement securities has never been good, and despite many years of capacity operation is still inadequate.

"This condition has renewed interest in manufacturing cost reductions, improving both gross and net income, and in a more accurate presentation of operating financial facts. Some increases in selling prices have occurred out of a realization, no doubt, that depressed cement prices during a period of inflation harmed cement company shareholders much more than it helped cement buyers. It is being recognized that a proper statement of gross income and a realistic valuation of real assets, together with depreciation thereon, is a necessary part of properly evaluating reported net profits."

Still another said: "One of the important developments during 1955 was what seemed to be a growing realization on the part of the people of our country that prosperous times might continue far into the future. Along with this came a realization that there would be need for something like a million homes a year for many years to come, along with many new schools, hospitals, and commercial buildings. At the same time it became apparent that the people of our country were deciding that we must set about a long time expansion of our highway system. All of these developments point to increased use of cement for many years to come."



The air distribution system at the Missouri Portland plant automatically homogenizes the material in the blending silos. Solenoid valves are controlled by a timer.

CEMENT SUPPLY

With 1955 and its rather widespread and serious shortages of cement behind us cement users—including contractors, ready-mix, concrete block and pipe manufacturers—and all others directly or indirectly interested in construction—meaning nearly all of us—are vitally interested in the prospective cement situation for 1956 and the ensuing years. Construction has become a vital factor in our economy and its continuance at a high level is necessary for continued prosperity. And construction volume is dependent on

the amount of cement available.

From all of the facts at hand it seems likely that the cement industry will have enough added capacity available by the start of the 1956 construction season to at least hold its own. As the year progresses more new capacity will come into production at an accelerated rate which should take care of any reasonable increase in construction volume. By the time the expected new highway program gets under way late in 1956 or early in 1957 there should be ample cement available to take care of it.

There is some doubt among those producers reporting that the industry will be able to meet the expected increase in demand in 1956 in all areas in spite of the huge expansion programs under way. Practically all are agreed however, that supply will move ahead of demand in 1957 when the full effect of these expansion programs will be felt.

The head of a company serving the East and Middlewest said: "A year ago I was apprehensive that our industry would not meet up to its responsibilities of providing adequate productive capacity. This whole picture has completely changed in the last twelve months and now I feel certain that there will be more than a sufficient amount of cement for all purposes by 1957."

According to an Eastern producer: "The demand in this area has increased, but with production facilities added in the past few years, it seems to me we should be able to meet the consumer demands unless unusual conditions develop such as defense programs and other exceptional types of work. In addition to this, the only real shortage which could develop would be delays through other shortages of material, and labor problems."

A Middlewestern producer said: "We have faced every year since the war demand for more cement than we have been able to supply, and have been concerned about the seeming shortages. We have made extensive inquiries in the area we serve to find projects which had been contemplated or started and which could not be completed because of lack of cement. These inquiries have developed the fact that very few major projects were dropped or left incomplete at the end of any year due to lack of cement."

Another Middlewestern producer said: "All of the information which we have been able to accumulate points to the conclusion that the industry will not be able to fully meet the demand for cement in 1956. As has been true in the past, some areas will be better off than others, at least until very late in the construction season. In our immediate area, we think that the total demand cannot be met by existing facilities, including some new capacity which will come in next year.

"By the end of 1957, however, we expect an increase of production in the Ohio-western Pennsylvania area of as much as 50 percent compared with 1955. This very great expansion should be more than adequate to meet the expected demand for some time after 1957, possibly until 1965; and probably a sufficient portion of this new capacity will be in operation early enough in 1957 to preclude any shortage in the area in that year.

"Briefly, then, we believe that 1956, from the customers' viewpoint, will be as bad as, or worse than, 1955, but that the industry will be over the hump after next year."

According to a company operating in the East and Middlewest: "This past year the supply of cement in our marketing areas has been short of the demand and I feel that our industry has a great responsibility to increase its capacity so that there may be ample cement available for all uses. There have been a great many developments within the cement consuming industries in recent years such as prestressed and precast concrete slabs and beams and new techniques such as lift slabs and tilt-up construction. These developments and techniques should be very aggressively promoted by our industry but we have not done so effectively because we have had no difficulty in selling out our available production."

An Eastern producer presents some interesting slants, as follows: ". . . there have been no particularly outstanding events in our industry in 1955, with one exception, the 'roving demand', something that has always been very true in our industry. In other words, because of particularly large spot projects in some portion of the country or other, one can have a stringency in one area in one year, but an adequate supply in the following year. Again, the measure of the shortage, that is, the number of barrels needed at any one time to change the market from a shortage to a surplus one, is absolutely impossible to determine. In our business, the contractor, for example, may need 100 barrels of cement on a job on Monday morning, and if there are 100 barrels there, then there is absolutely no shortage; but if there are only 90 barrels on hand, there is a bad shortage; and the same is true if the 100 barrels aren't available until Wednesday. Again, something that is particularly true of a standardized product, shortages lead to double ordering, etc., which exaggerates the apparent impact of the shortage; particularly in the area where weather is a factor in construction, we have had six or seven years when we were three to four weeks behind in our shipments, the weather suddenly changes and in twenty-four hours we are current and hopefully looking for shipping instructions!"

A producer in the Pacific Northwest said: "The industry has been criticized because they have not provided capacity to take care of the present day demand. In my opinion this criticism is very unjust. There has been a considerable increase in capacity and to have an excess capacity in times of peak demand is certainly an unhealthy condition. I think the industry is to be commended for their willingness to assume obligations in the face of rapidly increasing costs both for operation and new equipment."

Another producer in the same area said: "There has been no shortage of cement in the Pacific Northwest as a whole but certain areas have found it necessary to obtain shipments from outside their particular area in order to prevent a shortage."

A third from the same area said: "There may be, and undoubtedly are some shortages of cement in specific areas. We believe those shortages of supply are strictly limited to specific areas of unusually large single structures subject to high speed construction, such as the great toll ways in the extreme northeastern part of the United States, and of course the coming St. Lawrence Seaway. Here in the Northwest the past years we have been subject to the same single large construction project in the form of power dams. Currently, that situation does not exist here and capacities are quite able to take care of demand. As future dams in the Northwest may be authorized, appropriated, and actually started they undoubtedly will not all happen at once and cement plants now in the Northwest not only will be able to handle but will need their cement requirements."

According to a California producer: "Unless there is a very substantial increase in demand far beyond what is predicted for this area, it seems to me that the effect of

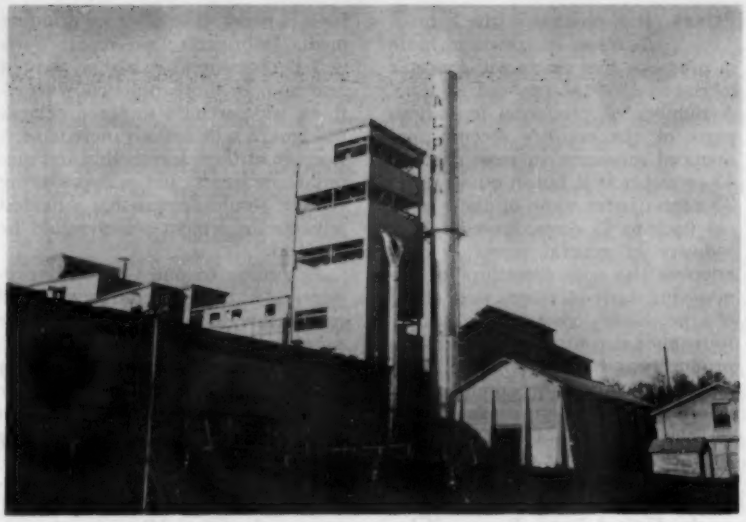
these plant expansions will be to create at least for some time a situation of overcapacity in the northern California cement industry. The U. S. Departments of Commerce and Labor, the F. W. Dodge Corporation and other well-informed organizations have forecast U. S. construction outlays for 1956 ranging up to 5 percent higher than 1955. According to the concensus of a group prediction made last month by the leading San Francisco business, government and educational forecasters, expenditures for new construction in California are expected to be 4 percent higher in 1956 than in 1955. The home building market in this state is thought to many to be approaching the saturation point. The federal highway program if approved by Congress will ultimately add only approximately 10 percent to California's over-all demand for cement."

Another California producer said: "There have been some temporary shortages, particularly in southern California and to a lesser degree in northern California; but these should be taken care of by capacity increases which should come in by next year."

In an effort to alleviate the cement shortage and to keep more of its customers supplied (while furnishing 88 percent of its production during the summer to large military projects) one East Coast producer imported almost half a million barrels of Danish clinker during 1955 and ground it into finished cement. This firm is of the opinion that "The grinding of such clinker as a steady practice would not only be unprofitable but a hazardous undertaking in view of fluctuating shipping costs and being dependent upon a supply of clinker several thousands miles away. With cartels in operation in Europe it is not as simple as it might appear in cement or clinker. I doubt whether the clinker would be available in times of European shortages at a satisfactory figure. Already the indicated market for 1956 is several dollars higher per ton than it was during 1955."

PROFITS, VALUE, AND COSTS

The very incomplete information on 1955 now available only confirms the general knowledge that the cement industry in 1955 made an excellent profit showing, possibly the best in its history. Compared to 1954, also an excellent profit year, volume was up substantially, as were prices and value. Information is available on only a few companies for the first 3 or 6 months of the year but this



This view of Alpha Portland Cement Company's plant at Catskill, N.Y., shows the new suspension-type preheater connected to the kiln.

substantiates the general feeling. Cement company stocks continue to grow in popularity with the investing public.

As is stated elsewhere the portland cement industry during the year changed its attitude from one of cautious optimism to one of full confidence in both immediate and future prosperity. This change was probably partly due to the growing realization that ours is no longer a boom economy likely to fall back in future sharp recessions, but a sound economy on a new and higher plateau far above any previous one. Also responsible was the price and profit situation within the industry which in the past few years has made cement company stocks desirable items. Prices had apparently finally reached a point in relation to costs where producers could really justify the construction of new plants or additions, and the replacement of obsolete equipment.

According to a tabulation by the National City Bank the net income for the cement industry in 1954 was 15.3 percent of sales, which was a higher ratio than that of any other industrial group. This figure is somewhat less impressive when it is learned that the amount reported as "Sales" by the cement industry is merely the mill net received for its product in bulk f.o.b. plant. The manufacturer actually receives about one-third more than this amount from customers as reimbursement for prepaid freight and the cost of paper bags, both items requiring the maintenance of large sums of working capital and therefore justifiably part of total net sales. On this basis net profit for 1954 would actually have been about 11½ percent of sales. The fact that the industry is only receiving an average of 17 to 18 cents per bbl. for depreciation is also a factor. On the basis of present plant construction costs it should be 40 cents per bbl., and if this were allowed then, according to one large producer, the net income of the cement industry in 1954 would have been only 8½ percent of total billings, or about the same as chemicals, glass products, and other allied industries requiring heavy capital investment.

More complete information is available on 1954. The dollar volume of sales f.o.b. plant for that year, judging from fairly complete reports, was up about 11 percent.

Value There are no official figures available on the value of the cement produced in 1955 or any part of the year. The fact that shipments were up about 9 percent and that numerous price increases were put into effect in all parts of the country during the year, however, make it certain that a new high record in value was set for the tenth consecutive year. Total value appears to have increased at least 11 percent for a new record of over $848,000,000.

Final government figures show that the value of the 274,096,000 bbl. of portland cement shipped from mills in 1954 was about $757,570,000 or $2.76 per bbl. at the plant. This was an increase of about $0.09 per bbl. over 1953 when the average value was $2.67 per bbl. In 1953 shipments of 260,880,000 bbl. were valued at $698,000,000 at the mill.

Prices It is obvious in the light of increases in costs and more in prospect, that prices will continue to rise in 1956 as they did in 1955. A number of producers in various parts of the country recently announced increases, in most cases of 15 cents per bbl., but in others up to 25 cents. Later some of these were cut back to 15 cents, however. The industry in general seems to have adopted the wise procedure of announcing such increases well ahead of the main construction season, thus giving contractors, ready-mix producers and others an opportunity to make firm bids on coming work.

The price situation is summarized by one producer as follows: "The price of cement has not advanced as rapidly as the price of other building materials. Since 1939, according to the United States Bureau of Labor Statistics, the average price of cement has risen 78 percent, whereas the composite price of all other building materials included in the index has risen 159 percent. In comparison with prewar prices, cement is still by far the cheapest major construction material on the market."

The attitude of producers on prices being received for cement is on the whole much more philosophical than it was a few years ago. According to one large company operating plants throughout the greater part of the country: "It was necessary to increase prices during the year at some locations to compensate for increased costs of bags, labor, fuel, power, machinery, repair parts, etc."

An Eastern producer said: "Recent sharply increased costs in our purchased materials—limestone, gypsum, dynamite, coal, etc.—have made it necessary for us to advance our price by 15 cents per barrel, effective January 1. And there is no cushion in this amount against the expected additional cost to come from a new labor agreement this coming spring."

Another said: "With the expansion program, and the increase in labor and material costs, we are forced to raise the price of cement, effective January 1st of next year."

Costs The cost situation within the industry is very well illustrated by one producer operating plants all over the country. He said: "The industry is confronted with formidable increases in manufacturing costs next year. On the heels of the generous concessions made by motors and steels, labor rates should and will be jacked up in the cement industry. The cost of coal and other fuels is rising. The price of grinding media, lubricants and repair parts will be considerably higher than a year ago. In short, practically everything we purchase to make cement will cost us substantially more money. Because of these foreseeable and material increases in manufacturing costs, it would appear that a modest advance in cement prices would be justified."

According to one California producer: "Labor costs have continued to increase as have prices in some purchased materials. We have been able to reduce our fuel costs, and our over-all manufacturing costs are down due to closer control of costs and improvements in manufacturing methods. In our opinion, there will be a continual trend in better manufacturing methods in order to keep costs under control."

Another said: ". . . cement plant construction costs have risen to the point where they now approach $10 to $12 per annual bbl. for new capacity and $4 to $5 per annual bbl. for additions to existing plants. Modest price increases in recent years have barely kept pace with rapidly mounting costs of labor, fuel, supplies and equipment. Because of intense competition in this area, there has been a considerable time lag between the announcement and the effective date of these price increases. Also because of competitive conditions, freight absorption has become widespread."

Still another said: "With labor rates continuing to rise along with the rising cost of supplies and repair parts—plus the high investment required for additional production capacity, it is inevitable that the price of cement will also be raised."

A company operating in the Middlewest and West said: "Costs of fuel and power have risen by leaps and bounds particularly in our areas. Labor costs are also continuously increasing. These facts plus the fact that new construction costs are ever increasing have and will continue to have an effect on prices for cement."

A company in the Northwest said: "There is a tendency at present to raise prices. Some increases are, no doubt, justified but we still carry along the old free and easy method of confusion which was set up by the war days and the excess profits tax . . ."

A producer in the Pacific Northwest said: "We certainly do not feel that the modest price of portland cement today is at all unreasonable when compared to the prices of other construction materials. Some may feel that increased cement prices are handicaps to production, but any reasonable survey will show that industry-wide cement price increases have only been what is absolutely necessary to cover rising costs to which the cement industry, like everyone else, is exposed."

1955 CAPACITY INCREASE

The portland cement industry in 1955 again increased its capacity considerably, probably more than in any post-war year. Compared to the huge increase under way for 1956, however, it was modest. Two new plants went into operation during 1955, as compared to two in 1954, none in 1953, three in 1952, three in 1951, four in 1950, one in 1949, two in 1948, and one in 1947—a total of 18 since V-J Day. One of these plants added to the industry's capacity, the other replaced an existing plant of about equal capacity.

In addition to the above at least 28 plants completed major expansion and improvement programs in 1955 which added considerably to their capacity and many others completed less important programs, some of which also added to capacity. As usual at this time of the year complete information is not yet available but we estimate that the actual amount of capacity installed must have been at least 20,000,000 bbl. annually. It is estimated that about 8,000,000 bbl. of this replaced old capacity, leaving an increase of about 12,000,000 bbl. during the year for a total of about 306,000,000 bbl., or about a 4 percent increase over the capacity of the industry at the end of 1954.

In our review of 1954, (published in the January, 1955 issue of PIT AND QUARRY) we estimated that plant additions in that year added about 5,000,000 bbl. of new annual capacity. According to a recent Bureau of Mines report the estimated annual capacity of the portland cement industry at the end of 1954 was 294,298,000 bbl., compared to 287,498,330 bbl. at the end of 1953. This was an actual increase of 6,799,670 bbl. or 2 percent.

According to our incomplete information 24 new kilns went into operation in 1955, some of which are known to have replaced old kilns that have been or will be dismantled. Considerable other equipment was also installed, including a large number of grinding mills, some of which are known to have been replacements. Much of this equipment was installed independently of kilns and some of it actually increased ca-

pacity by eliminating bottlenecks.

No existing plants are known to have been taken out of operation in 1955 but one of the two new plants, that of the Universal Atlas Cement Co. at Universal, Pa., replaced a plant on the same site of about equal capacity. The other new plant, that of the California Portland Cement Co., near Mojave, Calif., is an entirely new operation with a capacity of 6,000 bbl. daily.

In 1954 apparently about 92 percent of the year-end capacity of the industry was utilized, compared with official figures of 91 percent in 1953 and 87.8 percent in 1952. It has been estimated that at the end of 1955 the capacity of the industry was about 306,000,000 bbl., so about 91 percent of year-end capacity was apparently utilized.

Official figures on the capacity of the portland cement industry in the United States are as follows:

End of 1948	254,272,378	bbl.
" " 1949	258,948,399	"
" " 1950	259,448,000	"
" " 1951	281,873,000	"
" " 1952	284,014,416	"
" " 1953	287,498,330	"
" " 1954	294,298,000	"
" " 1955 (est.)	306,000,000	"

One large company, which carries on intensive studies of all phases of the industry, estimates that productive capacity at the end of 1955 was about 320,000,000 bbl. and that if all the announced additions to capacity materialize, the new total, when the present expansion program is completed in 1957 or later, will be in the range of 360 to 370 millions. In view of an expected continuing increase in cement demand, it is felt that capacity of this magnitude is justified.

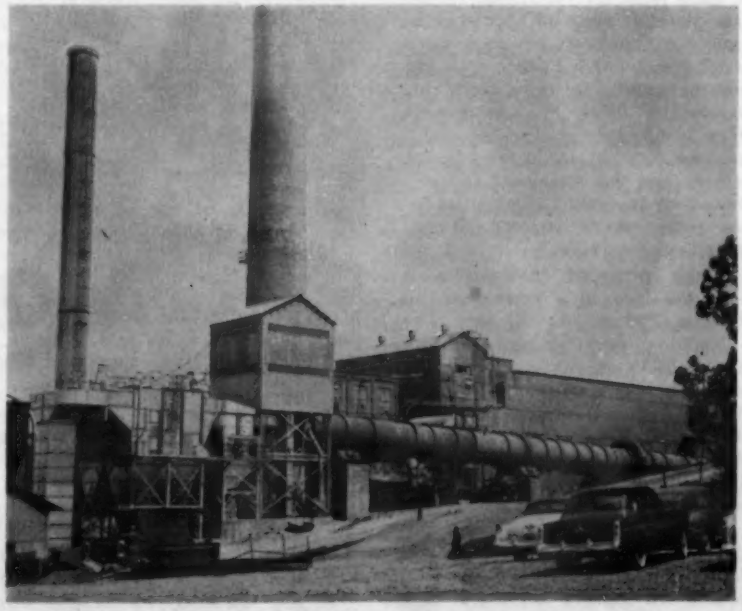
FUTURE INCREASE

At this time of the year the information available on the amount of plant expansion, even on new plants, to be completed in 1956 is necessarily incomplete. Actually projects not yet announced could be started and completed during the year. However, there are known to be 10 complete new plants under construction or definitely committed to be started in time for 1956 completion. These plants are: Consolidated Cement Corp., Paulding, Ohio; Ideal Cement Co., Houston, Texas, and Baton Rouge, La.; Lone Star Cement Corp., Lake Charles, La.; Marquette Cement Mfg. Co., Milwaukee, Wis., and Cape Girardeau, Mo.; Peerless Cement Corp., Detroit, Mich.; Permanente Cement Co., Victorville, Calif.; Texas Portland Cement Co., Orange, Texas; Universal Atlas Cement Co., Buffington, Ind., and Milwaukee, Wis., the latter clinker grinding, and shipping only. These plants will have a total of 14 kilns and are planned for a combined capacity of about 14,000,000 bbl. annually, of which apparently all would be new capacity for 1956. In addition to these there are a few other plants whose programs are of such magnitude and of such a nature that they will actually be new plants alongside of old. They are listed as expansion programs, however.

There are at least four other plants proposed by companies already in the cement or related industries which, if built, would probably not go into operation before 1957. The Ideal Cement Co. in its recently anounced $55,000,000 expansion program included plans for 1,300,000 bbl. new plants at Superior, Nebraska and Trident, Montana. The Dragon Cement Co., Northampton, Pa., early in 1955 announced that it is considering the possibility of building a $10,000,000 cement plant at West Stockbridge, Mass. The Riverton Lime & Stone Co., Inc., Riverton, Va., recently announced that it is considering construction of a 1,500,000 bbl. portland cement plant which would cost $10,000,000.

There are, in addition, the usual announcements of new plants proposed for various parts of the country by outside interests and it is possible that construction might actually start on one or more of these during 1956 for later completion. It was announced recently that the Strelene Realty Corp., an independent company, has plans for a 6,000-bbl.-per-day, $10,000,000 plant at Kingston, N. Y. The National Cement Co., San Bernardino, Calif., in May, 1955 announced plans for a $6,500,000 plant to be built at Ivanpah, Calif., near the Nevada line. A recent announcement states that the Hercules Portland Cement Co., a new concern, will build a 1,500 bbl. per day plant near Tulsa, Okla. A group of Texas businessmen plan to build a 900,000 bbl., $6,100,000 plant at Foreman, Ark., to go into operation about January, 1957. The Kennedy-Van Saun Mfg. and Eng. Corp., it is reported, will build the plant. There are the usual rumors about plants to be built in other states.

The amount of plant improvement or expansion now under way or definitely planned for completion in 1956 or later is at a record level. Here again our information is necessarily incomplete at this early date but it is known that at least 43 plants have such major programs either under way or definitely planned for 1956 completion. These involve 42 new kilns and a capacity of 38,500,000 bbl., of which about practically all will apparently be new capacity. A number of companies also report that they have major programs in preparation for announce-



The new 10½- by 340-ft. kiln installed by the Allentown Portland Cement Company at its West Conshohocken, Pa., plant. Dust collectors and the stack are at the left.

ment at a later date and still others report that they are making expansions at an appropriate time. The usual large number of minor improvement or maintenance programs are of course under way or definitely planned.

These expanded plants, together with the 10 new plants listed above for 1956 completion, will install at least 56 new kilns and a large amount of other equipment. These projects total at least 52,000,000 bbl. annually of capacity for 1956 of which it seems that at least 46,000,000 bbl. is intended to be new capacity. Allowing for the likelihood that some of these projects may carry over into 1957 and that others may never be started, also that more old equipment will be shut down than originaly intended, we feel that the new capacity added by the industry in 1956 could well amount to between 30,000,000 and 40,000,000 bbl., with some carry-over into 1957.

CURRENT CONDITIONS

A quick summary of conditions in the cement industry is given by a Pacific Coast producer who says: "In my opinion, the most important development in trend in 1955 in the cement industry has been the rash of plant expansions and new plants announced. As you know better than we do, there probably have been more plant expansions announced during the past year than for any time in the past 25 years. The effect on the industry as a whole should be good from several angles. In the first place, because of shortages in some areas, industry has received a poor press. Increased capacity should improve public relations from this standpoint. Since in our opinion there is still a great deal of growth to look forward to in the use of cement in this country, earnings should be favorably affected in future years from the current and contemplated expansion."

Much pertinent information is also contained in a letter from an Eastern producer, as follows: "The outstanding event in our industry during 1955, in my view, was the tremendous surge of plans for brand-new capacity, as reported in the press and business publications. It is very apparent that by the end of 1956 approximately 70-million barrels of new productive capacity will come into being; and a survey conducted by the U. S. Bureau of Mines indicates that something like a total productive capacity for the country of about 450-million barrels by 1959 appears to be in the making. No one knows better than you—but unfortunately the public cannot conceive of it—that planning, building and equipping a cement plant takes an unconscionable amount of time and a terrific amount of money.

"Our own company is an example. During the 'dirty thirties', when the capacity of the industry was far in excess of demand, we gave no thought to expansion but were trying to stay in the black. Then came the war years, particularly 1943 and 1944, when, because construction was ruled out, precious few cement companies were able to as much as break even. And throughout this cycle of about twenty-five years, the investment fraternities tagged our industry as highly cyclical, a prince or pauper business, with no investment attractiveness. So when the post-war boom got under way, it took our company about six years to get our financial house in order and to become able to undertake improvements and expansion with some assurance that it made sense to do so, and most importantly, to qualify for the credit necessary to pay for these improvements and additions. You are somewhat familiar with the program under way at our plant at the moment. In the past three years we have spent $2,200,000 to improve the effective capacity of our plant and to prepare for expansion; we have another project under way at the present time, costing approximately $1,100,000, and due for completion next April, which, again, is a completely necessary preliminary to an increase in our productive capacity. And finally, we have orders and contracts placed for a kiln installation, with necessary appurtenances, costing another $2,300,000, from which we hope to have an increase of about 35 percent in our capacity, and which cannot possibly come into use before October 1 of next year."

Typical of the optimistic attitude prevailing was the comment of the head of a large company operating plants throughout the greater part of the United States. He said: "Based on present indications supported by figures compiled by reliable sources, new construction in the United States will reach an all-time high of $44 billion during 1956, despite an expected decline in home building. This figure represents an increase of 5 percent over the record-breaking year of 1955. It appears, therefore, that the cement industry even with its increased productive facilities will be called upon to ship its entire production during the coming year."

Another large producer with widespread operations said: "Authoritative sources almost unanimously believe that construction in 1956 will exceed the record established this year. It is possible that a large, much needed, national highway program will be adopted by the next Congress and, while this may not result in much work until 1957, the removal of the uncertainty regarding the rate of future Federal Aid should stimulate state and urban highway planning."

A cautioning note was sounded by another large producer: "Of course the future prospects of the cement industry are bright, but we in the ..... Company have not forgotten that it is possible for our country to get over-built in good times and we are approaching the increase in our productive capacity with conservatism."

Still another large producer said: "It is our opinion that conditions in the cement industry are excellent and we continue to be optimistic, not only about business next year but, over the long pull, for years to come.

"We base this on the tremendous strides that are being made in developing new uses for concrete, the creation of new markets because of the steady and phenomenal increase in our national population since World War II, the outmoded and retarded status of our federal, state and local highway system which sooner or later must be regenerated, and the whole greatly expanded economy of our country which in turn creates necessity for industrial, commercial and public construction."

A large Eastern company said: "The year 1955 was, once again, a year of maximum demand and periods of very serious shortages in our immediate area, We feel that the year 1956 will again be a very good year for business; however, we definitely feel that it could become quite a competitive year from the cement manufacturers' viewpoint. We were able in the year of 1955 to better supply our dealer and trade accounts due to the fact that our overall capacity increased approximately 1,000,000 barrels."

An Eastern producer said: "1955 has been another year of high demand in the cement industry, as you well know, with some rather stringent shortages at times in various parts of the country. And once again the cement industry will surpass all previous records, for it is clearly indicated that shipments and production in 1955 will be something over 300

million barrels of cement. With an absolute minimum of labor trouble during 1955, it is our estimate that the production has been very close to the *current* effective capacity."

A "wait and see" attitude was expressed by a Middlewestern producer who said: ". . . with regard to conditions in the cement industry, I feel that for the most part they are better than they have been in previous years. While initial costs have increased, yet production has been good, there has been a better distribution of cement over the country as a whole.

"I think that there will be plenty of construction work for a number of years to come, thus it follows that there will be a large demand for cement. However, there are and will be soft spots in the country where the local demand does not warrant full production of the surrounding cement companies. Plants in these sections have had to depend upon a more outlying distribution to move the full volume of cement.

"As production is increased nationally, the companies centered in these soft spots will gradually have to return to their normal shipping territories with a cut-back from full production.

"The above concept does not take into consideration the so-called road program which last year, if I recall, was discussed at 110 billion dollars. At that time I made the statement that I would not become excited about a such a tremendous program until I found where the money was to be raised and allocated. I still feel that way in this matter."

New markets as a factor were mentioned by another Middlewestern producer: "In our area during the last several years, the market for cement has been on an ever increasing level and, in our opinion, the demand curve will continue to rise possibly at an increasing rate with the accelerated highway construction program getting into full swing. The trend toward more precast units being used in modern construction also indicates an increased use of cement."

Another Middlewestern producer said: "It is our belief that the construction industry will be very strong during the next ten or fifteen years and that the demand for cement will justify the current expansion programs being undertaken by the various cement producers. This belief is strengthened by our opinion that there must be some type of accelerated road building program and that such a program will require large amounts of cement. In addition, we see concrete being used in a number of new applications and believe that our inexpensive versatile product will continue to replace other building materials in many instances.

New cement storage silos of the Calaveras Cement Company at San Andreas, Calif., which are a part of a $4,000,000 expansion program to be completed late in 1956.

"One of the important problems faced by the industry, of course, is the matter of financing new productive capacity. After ten years of maximum sales, our industry is still obligated to borrow most of the money required for expansion purposes. It is our belief that the price of cement is too low relative to the costs of constructing new productive facilities and, consequently, we are considering the desirability of increasing our prices."

According to another Middlewestern producer: "In the areas where we operate, the current activity with respect to construction of toll roads is sure to create increased demand for cement. In addition, the normal requirements of the highway systems in our area have not been met for several years, which has resulted in a pent up demand which is bound to require attention in the immediate future years. All we can see in the future is that there will be an enormous annual demand for cement."

A company operating in the South and Southwest said: "For the year 1956 we expect the demand for cement will be as good as it has been in 1955 although there are some who believe the demand will be much greater and that we may expect further shortage of cement. We feel sure that the industry generally has been doing everything that it possibly could to increase productive capacities to take care of the demand for cements. It should be realized, however, that the great increase in the construction of toll roads has been one of the major factors requiring large quantities of cement. This has been added to the greatly increased demand for industrial construction of new production facilities for the Federal Highway Programs and continued expansion in public construction."

A Southern operator said: ". . . all the indications point to a continuing and even accelerated building of more plants to produce more goods. And the large highway improvement program appears to be a necessity. These conditions promise still heavier demand for cement.

"I am cautiously optimistic. I remember clearly the depression after 1929 which came just after we started operating our plant. And I am impressed by a remark credited to Dr. Arthur F. Burns, Chairman of the Council of Economic Advisors, as follows: 'In an economy such as ours, poised on a high plateau, neither the threat of inflation nor recession can be distant.'"

Still another Southern operator said: "We feel generally speaking that the conditions in the cement industry at the present time are very favorable. Also, that in the foreseeable future the prospects for the industry look good. Possibly the most important developments and trends during 1955 were the further shap-

ing up of basic plans for a nationwide highway construction program. Seemingly large additional sums for Federal and State, as well as new toll roads will be appropriated to effect this basic highway construction program. Further, it is increasingly evident that this new road construction will give additional impetus to general construction, which in turn will enhance the cement market picture."

A large company operating plants throughout the West says: "The volume of construction put in place in 1955 exceeded by a wide margin the most optimistic forecasts made at the beginning of the year. The current outlook for 1956 is for an even better year than the one just closed.

"We were disappointed over the failure of Congress to enact new legislation to finance the growing backlog of construction needed to bring our national highway system up to modern standards but believe that the necessity for this work cannot be denied and that the delay is only temporary.

"The rapid increase in population, caused by the continuing high birth rates despite an expected slump during this period and because of the improvement in the average life expectancy, portends a continual need for more new homes, schools, churches, commercial building and construction of all types. There is a mounting backlog of public works in the planning stage for water resources development and flood protection, the need for which was once again brought dramatically to the attention of the public during the disastrous floods in the East. . .

"Taking all of these things into consideration it appears that there will be no letup in the demand for cement for many years to come." . . .

According to a California producer: ". . . the available return on capital seems barely to justify investment in plant additions, but not in building of new plants. This is particularly so in view of the long range forecast of Northern California cement consumption recently made by a member of the Stanford Business School faculty. This source has predicted total cement usage in the area of 15.5 million barrels during 1960. In 1955, Northern California cement mills will have shipped a total of approximately 15.5 million barrels, of which more than 3 million barrels were shipped out of the area."

A producer in the Pacific Northwest said: "We believe that the cement industry is in a very healthy condition and that the future for the industry is probably as encouraging as at any time in its history. There have evidently been some severe shortages in certain areas during the past couple years. However, it is believed that the industry is making every reasonable effort to expand its productive capacity to handle the increased demand for cement. Expansion is going on in most every section of the country.

"The generally satisfactory economic situation of the country and the increase for new homes as well as the increased demand for manufactured products has kept the rate of home building, and commercial and public construction at a high level. It would appear that this situation would continue into the foreseeable future."

Another Northwestern producer said: "The future for the cement industry and for the extended use of concrete is one of the most promising of all industries because the rapid growth of air transportation and jet propulsion will require more and more concrete aprons and runways. The terrific increase of automobiles, which every American buys, will require more and more four-lane highways. The uncertain future of atomic energy will require more and more protection by concrete, and the steady building of cottages and cathedrals continues to require more and more concrete, and in many places."

HANDICAPS TO PRODUCTION

Producers were unanimous in stating that 1955 was remarkably free from strikes and other major handicaps to production although the usual minor ones were present. There was, however, some feeling that the industry might not be so fortunate in 1956. Quotations from some of these letters indicate the thinking on this subject.

According to one Eastern producer: "There are naturally handicaps in production, etc., when you attempt to run at peak capacity and variable demands. Unusual specific job demands created by delays in other materials, or strike conditions, create difficulties in production, distribution and costs."

A Middlewestern producer says: "There have not been during this year any particular handicaps to production that we know of, although it is true that delivery dates on new machinery are usually quite deferred."

According to a Southern producer: "We have had no shortages of labor, supplies or cars, nor any difficulties with them."

A California producer said: "There were no handicaps to production worth mentioning, nor were there any labor difficulties either in the form of shortages or strikes. There were no new trends in manufacturing methods and no noticeable acceleration in the trend towards truck shipments which we have been experiencing for many years."

One company in the Pacific Northwest feels that: "Labor bargaining occurs and reoccurs as regularly as taxes and all manufacturers work hard to keep these annual increases reasonable. By and large we believe they have been reasonable compared to those in any other heavy industry."

That the future may see some handicap to production was the opinion of a Southern producer who said that: "The cement industry will probably experience additional handicaps to production as a result of inflation. Manpower will likely be a serious problem, particularly skilled labor and competent supervision. Steel and electrical items will likely be in short supply. Manufacturing wages as well as overall manufacturing costs will probably increase over the next five to ten years as compared with the past ten year period."

MANUFACTURING TRENDS

Apparently the most important trend in manufacturing cement in 1955 was a continuation of one of several years standing, toward the use of larger kilns and raw- and clinker-grinding mills. There was, however, some dissenting opinion on this subject. Another continuing trend was the installation of dust collecting equipment to eliminate complaints from neighbors.

One Middlewestern producer said: "Trends in manufacturing methods, so far as we are concerned, have been to replace old kilns or install new kilns that are extra long and of large diameter, complete with modern instrument control. We have also converted to closed circuit grinding in both raw and finish departments, added short wave radios to plant locomotives, quarry shovels, trucks, and various departments, and built a number of cement storage silos with steel cone bottoms, placed over loading tracks to facilitate bulk loading."

A Southern producer said: "I have had opportunity during the past 2 years to inspect some of the newer cement plants and to discuss them with other cement people. The

very large kilns; the large mills operating in closed circuit; the modern packhouses, etc.—all with much auxiliary equipment more or less intricately interlocked—are spectacular. But I am not convinced that such ponderousness and elaboration is needed, or that it produces compensating overall economies. Recent talks with others suggest the start of a trend back to moderate size units and simpler layouts."

According to another Southern producer: "Trends in manufacturing methods are likely to continue on the utilization of larger higher capacity raw and finish grinding units, larger kilns, with more attention given to heat recuperation."

In the Pacific Northwest it was felt that: "Manufacturing methods are without doubt changing steadily in the direction of larger single units that will gain the greatest production per man hour of attendance."

On the subject of dust an Eastern producer said: "We feel that one of the important trends that has occurred in recent years has been the concerted effort on the part of taxpayer groups in the vicinity of our plants to insist upon a reduction of any dust contamination from our operations. We are basically in agreement with the fact that we should not be a nuisance; however, this is a trend that has gained momentum just within the last year to the point where we were actually forced to close down one plant during our active shipping season to complete the installation of equipment which would satisfy these demands."

At least one producer regards the suspension-type preheater developed in Germany and recently introduced in this country as the most important technological development in cement manufacturing in recent years.

One firm which produced a limited amount of portland blast furnace slag cement in 1955 plans to produce more of it in 1956. It is stated that although the economics of producing this type of cement are not yet completely known, it is known that in a time of short supply it is desirable to produce such cement.

Another large producer said "In late 1954 we began the production of portland blast furnace slag at two of our plants. This has enabled us to increase our production of finished cement at those plants with resultant benefit to our customers."

Changes In Ownership

There were again several changes in ownership in 1954 among cement plants and companies in the United States, all of them absorptions by large companies of small independent operators. The Penn-Dixie Cement Corp., which late in 1954 purchased the Petoskey Portland Cement Co. with a plant at Petoskey, Mich., early in 1955 purchased the Federal Portland Cement Co., with a plant at Buffalo, N. Y. It was also reported at that time that the former owners of Federal, the Bessemer Securities Co. of Youngstown, Ohio, may liquidate other properties including two other midwestern cement companies.

A change in ownership late in 1954, but which was not reported in the review of that year, was the acquisition of the Standard Lime & Stone Co. of Baltimore, Md., by the American Marietta Co. Standard operated a 1,750,000 bl. cement plant at Martinsburg, W. Va. The new owners at once announced an expansion program to be started immediately which will increase production 750,000 bbl. annually.

METHOD OF SHIPMENT

Producers in all parts of the country reported a continued trend toward bulk shipment of cement and it is believed that this trend will continue.

The trend toward truck shipment which has been going on for some years apparently slowed down considerably in some areas during 1955 but continued unabated in others. This was due to the new competitive rates with which the railroads are attempting to meet truck competition.

The president of one large company operating plants in the East and Middlewest said, "A year or two ago, I had estimated that by this time we would be shipping from certain of our plants by truck instead of by rail. I believe this would have come about if it had not been for the new tariffs involving trucking competitive rates which have been put into effect by the railroads. At the present time we ship about half of our production via truck and the balance via rail."

Another Middlewestern company said, "There is no material trend toward truck shipments in our market areas. Rail carriers have reduced freight rates on cement in some of our market areas to discourage truck shipments. For example, rates on cement in Illinois Freight Association territory have been so reduced with the approval of the Interstate Commerce Commission."

A Southern producer said, "It is not our opinion that truck shipments will move a higher percentage of cement tonnage than at the present time, because we feel that the railroads will adjust rail rates which will offset any appreciable increase in trucking."

Another Southern producer said: "What appeared to be a possible beginning of truck haul in this area was stopped by the new scale of cement rates put into effect by the railroads. We make no truck shipments."

A company in the Pacific Northwest said that "Truck shipments, percentagewise, are increasing steadily at the expense principally of rail shipments. There are instances where trucks have almost completely displaced rail. The trend of bulk water transport from cement mill to outlying terminal storage will still further increase the percentage of truck haul on the outlying and final local delivery."

A California producer said: "The trend in truck shipments . . . has not changed during the year. As you know, there is a greater use of trucks here in the West than in most parts of the country."

IMPORTS AND EXPORTS

A comparatively small amount of portland cement was exported from the United States to other countries in 1955. The usual shipments to Canada apparently dropped considerably as the supply situation there was better than here. Actually the usual situation was somewhat reversed as considerable cement was imported into the U. S. from Nova Scotia. There was, of course, the usual shipment of cement from this country to Alaska and to Hawaii, Guam and other Pacific islands.

Imports into this country, however, were widespread and in large volume. In addition to some cement from Canada and Puerto Rico cement was received from numerous European, Asian and South American manufacturers.

It is reported that one large city, located on one of the great Lakes, had received cement in 1955 from Canada and seven foreign countries. One producer estimates that during the year nearly 1,000,000 bbl. of cement came into Michigan alone from foreign countries or from states which normally do not supply Michigan. Some clinker was also imported from foreign countries for grinding here, including almost 500,000 bbl. from Denmark.

PLANT EXPANSIONS

Aetna The Aetna Portland Cement Co. reports that its 1,000,000-bbl. expansion program will be completed about February

1956. This will increase the plant's capacity to 3,000,000 bbl. annually. Included are: a 400-ft. kiln, grinding equipment, coolers, etc.

Allentown The Allentown Portland Cement Co. in February 1955 completed the installation of a 10½ by 340-ft. Traylor kiln and a new raw mill at its West Coushohocken, Pa., plant. This kiln has a capacity of 2,600 bbl. daily. No major future expansion plans have been announced.

Alpha The Alpha Portland Cement Co. in 1955 completed a rehabilitation program at its Catskill, N. Y., plant which increased its capacity 25 percent. Included was a new Fuller-Humboldt preheater, and replacement of its aerial tramway from quarry to plant by a 1-mile conveyor system. This work, including electrical engineering, was done by the Macdonald Engineering Co. The company reports that since 1945 it has increased its total productive capacity 20 percent and a further 20 percent increase is planned.

Arizona The Arizona Portland Cement Co., a subsidiary of the California Portland Cement Co., in mid-1955 completed the installation of a 335-ft. F. L. Smidth kiln, grinding equipment and storage facilities at its Rillito, Ariz. plant. This increased capacity 3,000 bbl. to 7,000 bbl. daily or 2,500,000 bbl. annually.

Ash Grove The Ash Grove Portland Cement Co. is reported to have near completion a $2,000,000 modernization program at its Chanute, Kans., plant. A new 10- by 325-ft. F. L. Smidth kiln and additional grinding facilities are being installed but capacity will not be increased.

Bessemer The Bessemer Limestone & Cement Co. is in the midst of a $3,600,000 construction program which will add 1,300,000 bbl. to the capacity of its plant at Walford Station, Pa. A new 12- by 450-ft. F. L. Smidth kiln and additional grinding equipment are being installed. This program is scheduled for completion in midsummer of 1956. Late in 1955 a 170,000-bbl. capacity bulk car and truck loading silo installation was completed. This work, including electrical engineering, is being done by the Macdonald Engineering Co.

Calaveras The Calaveras Cement Company in 1955 completed part of a program which will increase its capacity 1,200,000 bbl. by late 1956. This $4,000,000 program includes a fifth kiln, coolers, dust collectors, mills, storage silos, etc. The Allis-Chalmers kiln is 11¼- by 360-ft. This plant has been expanded 200 percent since World War II.

California The California Portland Cement Co. is reported to have put its new $12,000,000 plant near Mojave, Calif., into operation late in 1955. This 6,000 bbl. per day (2,000,000 bbl. per year) dry-process plant has two 12- by 11- by 350-ft. Allis-Chalmers kilns and five 10½- by 17-ft. ball mills.

Carolina Giant The Carolina Giant Cement Co., Harleyville, S. C., late in the summer of 1955 announced plans for increasing its capacity about 60 percent. This would raise its present 1,800,000 bbl. capacity to nearly 3,000,000 bbl. annually. A new kiln, raw mill, finish mill, cement storage silos, etc., are being designed and built by Macdonald Engineering Co.

Columbia Cement Div. The Columbia Cement Div. of the Pittsburgh Plate Glass Co. has under way an expansion of its plant near Zanesville, Ohio, which will increase its present 2,000,000 bbl. capacity by 1,000,000 bbl. annually. New equipment includes a kiln, finish grinding mill, etc. This equipment is expected to be in operation by the late summer of 1956. This work, including electrical engineering, is being done by the Macdonald Engineering Co.

Consolidated The Consolidated Cement Corp. is progressing with the construction of its now 1,250,000 bbl. cement plant at Paulding, Ohio, and expects to have it in operation late in 1956. This will be a 1-kiln wet process operation, with a 11¼- by 425-ft. F. L. Smidth kiln. It is located at the quarry which has for several years supplied the company's Cement City, Mich., plant and which will supply both plants.

The $2,650,000 rehabilitation and expansion program at Consolidated's Fredonia, Kans., plant was completed late in 1955. The installation of a new 425-ft. kiln, additional grinding equipment, etc., increased capacity 1,300,000 bbl. to a total of 2,300,000 bbl. annually.

Dewey The Dewey Portland Cement Co. in 1956 plans to rebuild and put back into operation one of its old 10½- by 200-ft. kilns and new silos and a finish mill. This is expected to add 400,000 bbl. annually to capacity. The Crosby Construction Co. is doing the engineering and construction.

Diamond The Diamond Portland Cement Co., Middle Branch, Ohio, which since 1946 had increased its production by 105 percent, has a program under way which will increase present output by 73 percent. This program will cost $4,000,000.

Dragon During 1955 the Dragon Cement Co., Inc., completed the installation of a fourth 600,00-bbl. kiln at its Northampton, Pa., plant. This followed the completion of a new 5-mill raw and finish grinding department in 1954. It is now felt that this plant is in balance in all respects.

Early in the year it was reported that the company had under consideration the building of a $10,000,000 new plant at West Stockbridge, Mass.

General The General Portland Cement Co. reports that, since it was formed in February, 1947, by a consolidation, it has carried on a steady improvement and expansion program which by the end of 1955 had increased its original 6,635,000 bbl. capacity to 14,600,000 bbl. In 1956 a 1,250,000 bbl. addition at Fort Worth, Texas, and 500,000 bbl. at Signal Mountain, Tenn., will raise this to 16,350,000 bbl., an increase of 146 percent over 1947. At each of these plants a 11¼- by 425-ft. F. L. Smidth kiln is being installed.

Early in 1955 the Trinity Division completed a 1,250,000 bbl. addition to its Houston, Texas, plant. A 1,250,000 addition to its Dallas, Texas, plant is under way. This consists of a new 425-ft. kiln, grinding equipment, etc.

Glens Falls Early in 1955 the Glens Falls Portland Cement Co., Glens Falls, N. Y., announced a $300,000 expansion and modernization program at its plant.

Halliburton There has been no recent information on the progress being made by the Halliburton Portland Cement Co. on its two plants in Arizona. A year ago plans were announced for two new 2,500-bbl. per day plants—one at Phoenix and one at Clarkdale. At the Corpus Christi, Texas, plant a new floating shell washing plant and additional bulk loading facilities are reported to have been installed in 1955. The new silos were designed and built by the Macdonald Engineering Company.

Hercules The Hercules Cement Corp. reports that the program of modernization at its Stockertown, Pa., plant, begun in

1948, will be nearing completion by the close of 1956. An increase in efficiency and an increase in capacity of from 2,800,000 to 3,300,000 bbl. is expected. The work now under way consists primarily of the replacement of milling and material-handling facilities and of the remaining four old kilns with a single new 12- by 280-ft. F. L. Smidth kiln identical with the two previously installed.

Huron The Huron Portland Cement Co. was one of the first to foresee the post-war boom and asked for quotations on new equipment shortly after V-J Day. Two kilns were ordered on October 18, 1945. Since then the expansion of its Alpena, Mich., plant has been almost continuous and it now has what is claimed to be the largest single cement mill in the world. As a result, at the start of 1955 this plant had a clinker production capacity of 9,000,000 bbl. annually or 26,000 bbl. daily, and the finish grinding capacity at Alpena and the new Superior, Wis., grinding plant totals 38,500 bbl. daily. Equipment installed during 1955 is said to have added another 1,000,000 bbl. of capacity.

In mid-1955 contracts were let for additions which are expected to add 3,000,000 bbl. of capacity by April 1, 1956, for a total of 12,000,000 bbl. annually. Major items of equipment included two raw mills, two 11- by 175-ft. rotary kilns with Fuller - Humboldt suspension - type preheaters, three finish mills, air separators, etc. The McDowell Co. has the contracts for most of the new buildings and related equipment.

Ideal After a few years of comparatively low expenditures following a huge expansion program the Ideal Cement Co. announced in June, 1955, that it had embarked on a new $55,000,000 program which will increase the productive capacity of the company by 50 percent. Three new plants are to be built and six others will be expanded. The first phase, totaling $35,000,000, will be completed in 1956 and most of this is under construction.

The first new plant to be built will be at Houston, Texas, adjacent to the company's present plant on the ship channel. It will have an annual capacity of 1,525,000 bbl. which will increase the capacity of the Houston facilities to 2,775,000 bbl. per year. The cost of this expansion is estimated to be $10,700,000, and completion is expected in July, 1956.

At the Baton Rouge plant a new kiln, a new raw mill and a new finish mill with auxiliary equipment are being installed. Additional cement storage capacity for 152,000 bbl. is being constructed. At the New Orleans Terminal additional storage facilities for 152,000 bbl. and more efficient handling equipment are being installed. The new kiln will increase capacity by approximately 620,000 bbl. per year, increasing the total capacity of the Baton Rouge plant to 2,720,000 bbl. per year. The cost of this expansion is estimated to be $5,000,000, and completion is scheduled for April, 1956.

The Okay, Ark., expansion involves installation of a new kiln, two grinding mills and auxiliary equipment. Additional storage capacity for 152,000 bbl. will be constructed. The new kiln will increase capacity by approximately 1,250,000 bbl. per year, increasing the total capacity of the Okay plant to 2,600,000 bbl. per year. The cost of this expansion is estimated to be $6,000,000, and completion is expected in August, 1956.

The Ada, Okla., expansion involves installation of a new kiln, two grinding mills and auxiliary equipment. Additional storage capacity for 152,000 bbl. will be constructed. The new kiln will increase capacity by approximately 1,400,000 bbl. per year, increasing the total capacity of the Ada plant to 3,550,000 bbl. per year. The cost of this expansion is estimated to be $3,800,000, and the approximate completion date is July, 1956.

The Boettcher, Colo., expansion involves installation of Fuller-Humboldt preheaters, two new 1500 hp. raw mills, modern dust collecting system and additional storage capacity for 152,000 bbl. New facilities will increase capacity from 1,250,000 bbl. to 2,400,000 bbl. per year. The cost of this expansion is estimated to be $6,300,000; and completion is expected in July, 1956.

The Mobile, Ala., plant will be completely remodeled. New construction involves new utility building to house offices, chemical and physical laboratories, and wash and change facilities for employees; new dock facilities, slurry tanks, additional storage and loading facilities and new production equipment including a modern dust collecting system. Improvements will increase capacity from 2,200,000 bbl. to 2,518,000 bbl. per year. The cost of this expansion is estimated to be $6,000,000, and completion is scheduled for the spring of 1957.

For the Redwood City, Calif., engineering studies are underway for the installation of a new kiln, mills and auxiliary equipment. Clinker coolers are being installed. Proposed additional capacity 1,300,000 bbl., which would increase total capacity to 3,600,000 bbl. per year. The cost of this expansion is estimated to be $6,000,000. Completion date is indefinite, dependent upon results of engineering studies.

At Superior, Neb., a new cement plant will be built adjacent to the existing cement plant. The new plant will have a capacity of 1,300,000 bbl., which will increase the capacity of the Superior facilities to 2,350,000 bbl. per year. The cost of this expansion is estimated to be $5,000,000. The date of availability of increased production is indefinite at this time.

At Trident, Mont., a new cement plant will be built adjacent to the existing cement plant. The new plant will have a capacity of 1,300,000 bbl., which will increase the capacity of the Trident facilities to 2,500,000 bbl. per year. The cost of this expansion is estimated to be $6,000,000. The date of availability of increased production is indefinite at this time.

In 1955 Ideal did a moderate amount of work, totaling about $5,500,000, including added cement storage capacity at its Mobile, Ala., Baton Rouge, La., and Houston, Texas, plants and at its New Orleans, La., distributing plant. A $250,000 bulk storage plant was also built at Salt Lake City, Utah. There was also some modernization of the San Juan Bautista, Calif., plant.

Keystone Early in 1955 the Keystone Portland Cement Co. announced that it would increase the capacity of its plant at Bath, Pa., 25 percent by the installation of a new kiln and other equipment. Completion of this program was scheduled for late 1955.

Kosmos The Kosmos Portland Cement Co. in 1955 completed the installation of a new kiln and expects to have another one in operation in 1956. It is stated that the goal is a productive capacity 2½ times that at the end of the war. Extensive additions in other departments will be made in order to realize this aim sometime in 1958.

Lehigh The biggest project on the program of the Lehigh Portland Cement Co. is the $21,000,000 expansion of its Union Bridge, Md., plant. This will increase capacity about 2,000,000 bbl.

to over 3,000,000 bbl. annually and is being done without interference to production. It is estimated that about $17,000,000 of the total cost will be expended in 1956. Operations are expected to begin late in 1956. Three 400-ft. F. L. Smidth kilns are being installed.

At the company's Bunnell, Fla., plant, which went into operation in December, 1952, a third 10½- by 380-ft. F. L. Smidth kiln was installed early in 1955 and a fourth Smidth kiln is now being added. Additional grinding and other equipment is included. Each kiln has an annual capacity of about 775,000 bbl.

At its Fogelsville, Pa., plant Lehigh in 1955 installed a Fuller-Humboldt heat recuperating unit and this has increased capacity 100,000 bbl. annually.

When the 1956 work is completed, the company estimates that it will have increased its capacity to 27,-200,000 bbl., an increase of 41 percent since 1945. Including the $16,-000,000 spent in 1955, the cost of improvements since 1945 totals $82,-000,000.

Work to be done in 1956 will include new cement storage and packing facilities at the Buffalo, N.Y., and Metaline Falls, Wash., plants, at a cost of about $4,000,000. Expenditures at Union Bridge, Bunnell, and elsewhere will bring the 1956 total to about $25,000,000.

Just anounced are plans to increase the capacity of Lehigh's Mason City, Ia., plant by 1,000,000 bbl. annually, a 50 percent increase. This will be done without interference to current output. It was also announced that by the end of 1957 Lehigh will have spent more than $122,000,000 for added capacity and rehabilitation in its post-war program.

Lone Star The Lone Star Cement Corp. is continuing its expansion program in 1956 by the construction of a new plant and the expansion of six others. This program involves an expenditure of $57,000,000 and an increase in capacity of 10,200,000 bbl. This makes a total outlay of $128,000,000 for expansion and modernization from 1946 to 1956, with a total increase in capacity of 19,200,000 bbl.—17,-000,000 of it in this country. This program will bring the capacity of the Lone Star system up to a total of 44,500,000 bbl.—32,600,000 bbl. for U. S. consumption.

The new Lake Charles plant will be a 2,000,000-bbl. wet process operation and will cost $14,000,000. It will be located on the Calcasieu River near Lake Charles, and will receive raw materials—oyster shell, clay and sand—and ship its product, by water. There will be two 11½- by 450-ft. kilns and electrical dust collectors will be used. It is slated for completion in late 1956.

Also included in the new program is the installation of two 275-ft. F. L. Smidth kilns, with coolers, etc., and grinding equipment at the Lone Star plant in Dallas, Tex. Productive capacity will be increased by 1,400,000 bbl. to a total of 3,700,000 bbl. annually. Electrical collectors will be installed on these as well as on the four older kilns.

The Houston, Tex., plant will get a third (11¼- by 400-ft.) F. L. Smidth kiln, with cooler and other related equipment, which will increase its capacity 1,100,000 bbl. to a total of 3,200,600 bbl.

At Hudson, N.Y., Lone Star will install a fifth kiln, cooler, crushing plant, grinding equipment, etc. to increase the capacity of this plant by 1,000,000 bbl. to a total of 3,000,-000 bbl. annually. These three expansions may be completed by late 1956. In all cases the work will be done without interference to production.

Three other projects announced last summer for completion in early 1956 involve the expansion of plants at Roanoke, Va., Nazareth, Pa., and Spocari, Ala. In each case a new kiln and grinding equipment are being added. At Roanoke capacity is being increased 800,000 bbl., at Nazareth, 900,000 bbl. and at Spocari 500,000 bbl. annually.

Early in 1955 Lone Star completed a program which included the remodeling and enlarging of its plants at Greencastle, Ind., and Boner Springs, Kans. At Greencastle a 10- by 240-ft. F. L. Smidth kiln was installed, along with other equipment and capacity was increased 600,000 bbl. to a total of 2,600,000 bbl. annually. At Bonner Springs a 340-ft. kiln, mills, etc. were installed by the contractor, Macdonald Enginereing Co.

Longhorn The Longhorn Portland Cement Co., Longhorn, Tex., during 1955 completed the installation of a new kiln—its third—a cooler and a grinding mill. This increased the capacity of this plant 700,000 bbl., to 2,500,000 bbl.

Marquette The Marquette Cement Mfg. Co. early in the year annonuced its intention to provide additional production facilities for the Chicago area. This was crystallized recently with the announcement that a new 1,250,000 bbl. plant would be built in Milwaukee, Wis., at a cost of about $7,000,000. This plant will feature a "double-pass" Allis-Chalmers Lepol kiln which it is said will in its 165 ft. length have the capacity of a 450-ft. straight rotary kiln. Limestone and coal will be received by boat. The contract for the design and construction of this plant has been awarded and it is scheduled for completion late in 1956.

Another new plant is to be built alongside the present plant at Cape Girardeau, Mo., and will provide additional capacity of 1,250,000 bbl. annually. This will be a 1-kiln (12- by 450-ft.) wet process operation and will cost about $7,000,000. Several innovations will be included in its design. The contract for the design and construction of this plant has been awarded to Kaiser Engineers. Construction will begin in March and the plant is scheduled for completion late in 1956.

Included in the company's program is some further expansion of the Des Moines, Iowa, plant which will increase its capacity 400,000 to 500,000 bbl. annually. Added grinding facilities are involved. This work will cost about $1,750,000 and is scheduled for completion in mid-1956. When completed this entire program will increase the company's total producing capacity about 3,-000,000 bbl. to 16,000,000 bbl. annually.

In 1955 Marquette expended $3,580,000 on improvements to its newly-acquired Superior, Ohio, and Rockmart, Ga., plants. The Superior work consisted largely of conversion from underground to open-pit mining, a new crushing department, and an 1800-ft. conveyor system to the main plant. This work increased capacity about 200,000 bbl. to 1,000,-000 bbl. annually.

At Rockmart about $1,500,000 was spent for a new 12- by 380-ft. kiln and related equipment and the construction of new storage and packing facilities. Minor improvements were also made at other plants.

Medusa The Medusa Portland Cement Co. late in 1955 completed the installation of a new kiln and other equipment at its York, Pa., grey cement plant which doubled its 600,000 bbl. annual capacity.

Early in 1955 the installation of another kiln at York was begun. Work was also started at the Dixon, Ill., plant on an $8,000,000 rebuilding project which will also add

about 1,000,000 bbl. to its capacity. This plant incorporates the principle of the Fuller-Humboldt preheater.

This work will bring to 10,250,000 bbl. the capacity of the company's seven plants, compared to 8,250,000 bbl. at the present time. It is part of a 5-year, $25,000,000 program announced a year ago.

Missouri The Missouri Portland Cement Company, which late in 1954 completed a new 3,000-bbl. per day dry process cement plant at Sugar Creek (near Independence), Mo., recently announced a mutimillion-dollar expansion program which will increase its capacity from 1,200,000 up to 2,400,000 bbl. yearly. New equipment will include a second 360-ft. kiln and grinding mills. Both kilns are to be equipped with electrical precipitators. This project is expected to be completed early in 1957.

In 1955 a third kiln was installed in Missouri's Prospect Hill plant (near St. Louis), which was built in 1950. This 12- by 450-ft. Allis-Chalmers kiln with its 6- by 100-ft. air-quenching cooler added 1,350,000 bbl. per year to the capacity of this plant, which now totals 4,800,000 bbl. annually. Ten new cement storage silos with a total capacity of 160,000 bbl. were also added in 1955. This work was done by the Macdonald Engineering Company.

Monarch The Monarch Cement Co. in 1955 completed a new crushing plant and a new 7500-kw. power plant. A combined raw and finish grinding department and raw and clinker storage silos are being designed by the Macdonald Engineering Company.

Monolith The Monolith Portland Cement Co. is reported to be planning an increase in capacity as its Tehachapi, Calif., plant.

North American The North American Cement Corp. reports that in 1955 it spent about $5,000,000 on a plant improvement and expansion program which, when completed in mid-1956, will have increased its capacity an additional 1,000,000 bbl. over the 1955 output. This work includes the expansion of the Howes Cave, N.Y., plant and its conversion from the wet to the dry process. Every department of the plant will be affected and capacity will be increased 3000 bbl. to 8000 bbl. daily. Included is the rebuilding of several kilns, new mills, Fuller coolers, new cement storage, etc. At the Security, Md., plant a Fuller-Humboldt preheater a new raw mill, driers, etc., are being installed. Crosby Construction Co. is doing the engineering on both plants and the construction at Security.

Northwestern States The Northwestern States Portland Cement Co., Mason City, Iowa, is reported to be completing the installation of three new kilns and other equipment, replacing six old kilns. This work was designed and built by the Macdonald Engineering Company.

Oregon The Oregon Portland Cement Co. has under way expansion programs at each of its two plants. At Oswego, Oreg., it has under construction a complete new unit costing $3,000,000 which will increase the capacity 50 percent or 700,000 bbl. annually. New equipment includes a new 287-ft. F. L. Smidth kiln, dust collectors, mills, crushers, etc. This work is cheduled for completion early in 1956.

A new kiln has been ordered for the Lime, Oreg., plant which will double its capacity.

Peerless The Peerless Cement Corporation late in 1955 announced the start of construction on a new 1,000,000 bbl., cement plant, its third, located ½ mile from its present Detroit, Mich., plant. This $7,500,000 operation will have a 11½- by 425-ft. kiln and at the present time will be equipped for bulk shipments only. It will not replace any existing capacity and is expected to be in operation in the summer of 1956.

Penn-Dixie The Penn-Dixie Cement Corp., which late in 1955 took over the plant of the Petoskey Cement Co. at Petoskey, Mich., has just completed a $5,000,000 expansion program at that plant. A new 375-ft. kiln and other equipment was installed, with an increase of 1,000,000 bbl. annually.

Construction has already started on an expansion of the Des Moines, Iowa, plant, which will involve a new 11- by 375-ft. kiln, electrical precipitators, and other equipment. Capacity will be increased 1,000,000 bbl. to 2,340,000 bbl. anually at a cost of $4,500,000. This work is expected to be completed in August.

Permanente The latest information on the Permanente Cement Company's new plant near Lucerne Valley, Calif., southeast of Victorville, Calif., is that it will be in operation late in 1956. This $12,000,000 operation will have a capacity of 2,000,000 bbl. annually. Work is already under way on the development of the limestone deposit which will also supply flux stone for Kaiser's Fontana steel plant.

Work is also proceeding rapidly on the $4,000,000 expansion of the plant at Permanente, Calif., which is being increased 1,400,000 bbl. in capacity to 8,400,000 bbl. annually. Equipment being added includes a 12- by 450-ft. F. L. Smidth kiln, (its sixth) two grinding mills, two electrostatic dust collectors, etc. This work is expected to be completed by June, 1956.

Pittsburgh Coke The Pittsburgh Coke & Chemical Co. recently anounced a $500,000 expansion of its plant at Neville Island, Pa., which will increase its capacity 400,000 bbl. to a total of 2,000,000 bbl. by the Spring of 1956.

Ponce The plant of the Ponce Cement Corp., Ponce, Puerto Rico, is undergoing an extensive expansion which will be completed some time in 1956. Included is a 12- by 500-ft. kiln with a capacity of 4300 bbl. daily, two grinding mills, a cooler, etc., all furnished by Allis-Chalmers.

Riverside The Riverside Cement Co. during 1955 is reported to have completed the installation of a $4,000,000 waste-heat power plant at its Oro Grande, Calif. plant. At its Crestmore, Calif., plant the block caving system of mining was replaced by the room and pillar system. It was announced that a $1,500,000 dust collecting system would be installed in 1956.

Dakota The South Dakota State Cement Plant, Rapid City, S. D., is said to be completing the installation of a new kiln, raw mill, silos, etc. Capacity will be increased 900,000 bbl. to 2,250,000 bbl. annually. This work, including electrical engineering, is being done by the Macdonald Engineering Co.

Southern The Southern Cement Co., which early in 1954 put in operation a new 1,000,000-bbl. cement plant at Roberta, Ala., in 1955 added considerable additional capacity. *It is stated that there* are some basic plans for further expansion during 1956.

Southwestern The Southwestern Portland Cement Co. is reported to have recently ordered a kiln and other equipment to increase the capacity of its Victorville, Calif., plant by 15 percent. A $500,000 program at its El Paso, Tex., plant will increase capacity 1,000 bbl. daily.

(*Continued on page* 170)

Review and Forecast

Aggregates Industries

Aggregates Output Maintains High Pace

Producers Back Up Optimism For 1956 With Expansion, New Plant Plans

By BUREN C. HEROD

IN answer to the annual survey conducted by PIT AND QUARRY during the last few weeks of 1955, the questionnaires returned from all sections of the country give indication that last year's production of sand and gravel and crushed stone exceeded that of 1954 as in the preceding survey, and that there is good reason to expect another new production record in 1956. This is a natural parallel to the constantly increasing volume of construction which consumed nearly 90 percent of the commercial sand and gravel output and about 62 percent of the crushed stone production.

This year revised and detailed forms were sent to several thousand aggregate producers representing a nation-wide cross section, and production data returned on those questionnaires for the years 1953, 1954 and 1955 were compared with the latest tonnage figures assembled by the Bureau of Mines (1953).

On that basis the estimate made last year covering the sand and gravel production in 1953 was high by a nominal percentage, and it appears that the 1954 output approached 450,000,000 tons (both commercial and non-commercial) instead of the 468,000,000 tons then predicted—but still about a 3 percent increase. The forecast made in January a year ago of 1955 production (475,000,000 tons) has gained further support from the 8 percent increase in 1955 over 1953 as reported by answering producers. Other information at hand complementing that in the survey forms points out the possibility of a further production rise in 1956 that might show a total of 490,000,000 tons by the end of the year.

Figures furnished by surveyed operators show that 48 percent of all those answering anticipate a substantially greater output this year—only 1 percent expect to produce a lesser amount. Optimism was not expressed merely in terms of tonnage but was backed up by the significant percentages of operations where new plants are contemplated or under construction, and where capacities are being expanded to meet greater demands.

Respectable gains were also evident in the crushed stone picture. The estimate of 1953 production made last year was only a shade over the actual figure—304,496,233 short tons—as reported by the Bureau of Mines, and her producers' data, 1954 showed a gain of approximately 3 percent over 1953. This would indicate a production of about 313,000,000 tons in 1954. They estimate that 1955 picked up about another 1 percent over the preceding year and may have established a new record of 316,000,000 tons—or an overall increase of 4 percent over the latest known production in 1953.

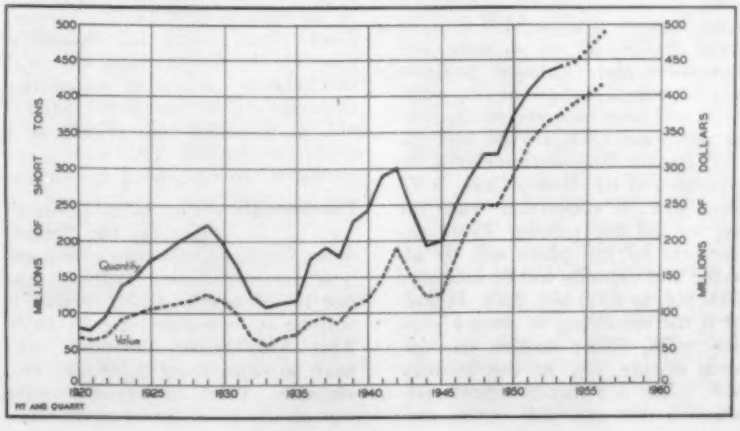
Optimism shown by crushed stone producers with respect to a continuing gain in 1956 was almost universal—only one section of the country, the Southeast, expecting a possible drop. While reasons given in support of probable increases ranged from expected larger demands for aggregates in building and highway construction through greater steel output, new housing, and population growth to lowering of production costs, no substantiating statements were given by those who anticipated a decline. The outlook for 1956 would then seem to indicate that production may reach a total of 330,000,000 short tons—approximately 5 percent over 1955.

That possibility is abetted by the number (approximately one-third) of answering crushed stone operations where expansion plans are on the board or in progress.

Concrete aggregates and roadstone have undoubtedly conformed to the 1952 and 1953 picture when those categories accounted for more than 60 percent of the crushed stone output. Roadbuilding and other heavy construction have continued to stimulate the aggregate output, while sales of fluxing stone which was reported in the survey to represent from 1 percent (North Central) to 13 percent (West) of the total dropped in relation to the 13 percent known in 1953. Agstone output, after dropping about 2 percent in 1954 from the previous year, probably maintained an even level in 1955.

This year the questionnaires have been segregated to geographic sectors

Production of sand and gravel in the United States, 1920-1955 (includes both commercial and non-commercial operations). Note: Data through 1953 is adapted from latest Bureau of Mines publications—1954 and 1955 figures represent estimates made by Pit and Quarry based on replies to our questionnaire survey.



which more nearly conform to marketing areas as delineated by the U. S. Department of Commerce. In fact the areas set up in this survey differ from the foregoing only to the extent of combining, in some sections, the subdivisions used by that government agency. It is felt that the grouping used this year will give the individual operator a better perspective with relation to his particular region.

In addition to requesting data on production figures for 1955 and the preceding two years, our forms again provided for gathering such information as selling price, average wages, and hourly capacities in order to make a comparison between 1955 and the preceding period. Comments were requested in regard to possible exapnsion, modernization, and plans for new plant construction, along with the individual operator's outlook on the coming year —particularly in relation to the highway program.

SAND AND GRAVEL

The impressive volume of tonnage estimated for 1955 (475,000,000 tons) derives its support largely from the average expected increase over the latest definitely known production in 1953 as indicated on returns from producers in all parts of the country. This cross-section average was slightly over 8 percent with the North Central area expecting a 15 percent gain and the Northeast and Southeast sections anticipating 3½ and 3 percent increases respectively. The over all estimated gain was not materially affected by the 3½ percent drops expected by the Southeast and West.

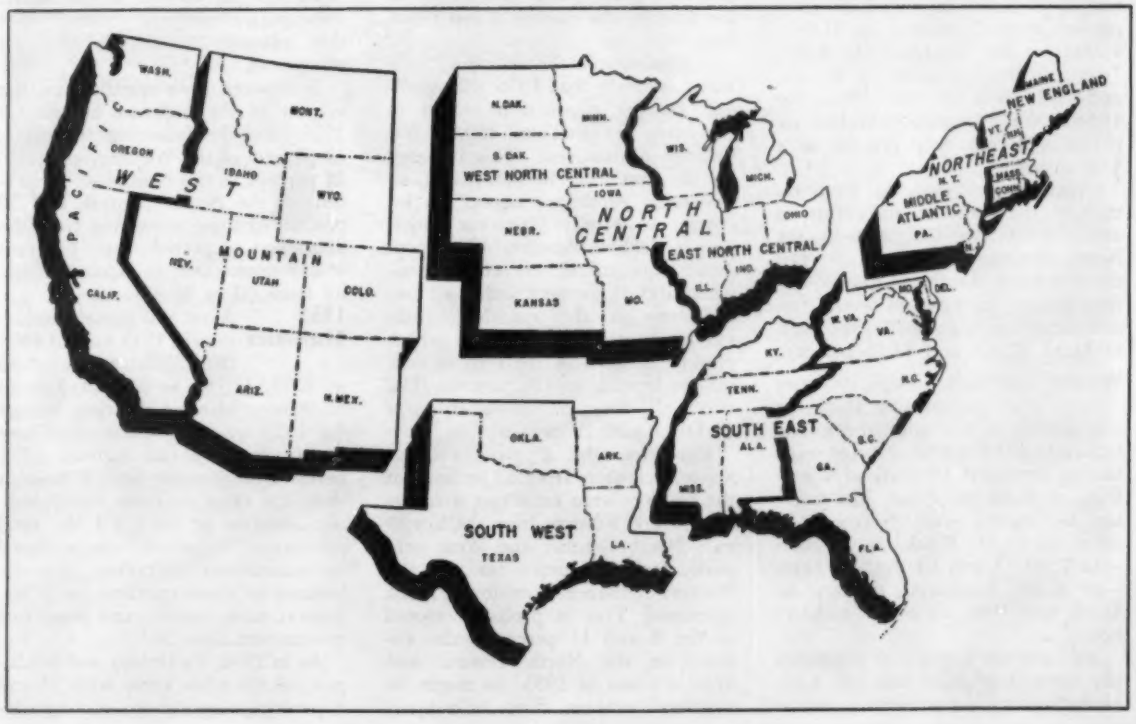
Using the operators' figures in comparing 1955 with 1954 the regional variations stand out rather more sharply. Here gains were expected as follows: North Central—8 percent, Southeast—5½ percent, Southwest—2½ percent, and West —almost 10 percent. The Northeast, however, showed an 8 percent expected decline from the preceding year. For the three-year period, therefore, only the Southeast and West have indicated that production was somewhat lower toward the end than at the beginning, with the latter section probably regaining lost ground.

Hourly Capacity In considering hourly plant capacities a comparison has been made of the data presented for each of the two past years. Due to the natural limitations inherent in a survey of this nature, this data is not regarded as absolute, but it does appear to assume a logical place in the overall picture of industry growth.

The average hourly output for all sections of the country a year ago is given as 180 t.p.h. During the succeeding period that average grew a little more than 7 percent to the current 193 t.p.h. figure. Greater capacities were reported in all sections but one—the Southeast—which dropped 15 percent (440 to 375 t.p.h.). The northeast showed a gain of 11 percent—from 89 to 99 t.p.h.; the North Central, 8 percent—153 to 165 t.p.h.; Southwest, 2½ percent—247 to 253 t.p.h.; and the West, 14 percent—260 to 297 t.p.h.

Almost 90 percent of the answering plants indicated that they have washing facilities that were used in cleaning an average of 94 percent of their product. By section, the percentage of plants using washing equipment was: Northeast—78 percent, Southeast—80 percent, North Central—96 percent, Southwest—100 percent, and West—89 percent.

An interesting sidelight concerning the possible nature of regional deposits is that in the North Central, Southwest, and West, 75, 67, and 89 percent (respectively) of the plants had crushing facilities, while in the Northeast and Southeast these percentages were only 33 and 40. It was reported that 48 percent of



This map was used to make the territorial breakdown for our survey. We used the Department of Commerce Regions, except for the South, which we divided into the Southwest and Southeast, as indicated. No consideration was given to the Division breakdown shown on the map.

the gravel produced in the Northeast was crushed, 22 percent in the North Central, 28 percent in the Southwest, and 75 percent in the West.

In answer to a question concerning the type of plant, i.e. stationary or portable, operation of the latter was reported by 14 percent of answering plants in the Northeast, 20 percent — Southeast, 15 percent — North Central, and 29 percent — West.

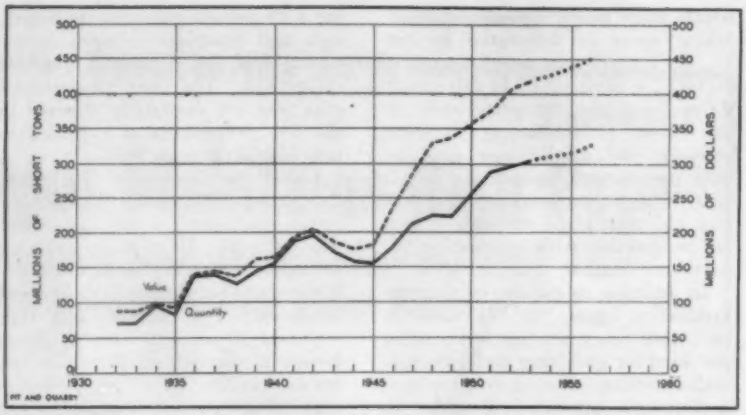
The average number of months of plant operation during the year (1955) for all sections proved to be 10.5. The Southwest led with year-round operation, and was followed by the Southeast — 11.6 months, West—10.9 months, Northeast—9.2 months, and North Central—8.8 months. This has a direct and obvious relation to the information collected in answer to a question on types of operation—which indicated that dredging is carried out by 30 to 33 percent of answering plants in the two eastern sections and the North Central region.

Selling Price The average, country-wide, selling price of sand took a substantial jump of 6 percent during 1955 in comparison with the rise enjoyed in 1954, and the figure now given is that of an average $1.13 per ton. Gravel also increased in value to an average of $1.50 per ton, or about 3 cents more than in the preceding year. By section, sand prices increased 19 cents per ton in the Northeast (to $1.04), 4 cents in the Southeast (to $.82), 7 cents in the Southwest (to $1.15), and 2½ cents in the West (to $1.66). North Central producers reported a 2 cent drop per ton to a $.96 average.

Gravel prices seem to have remained the same in the West at about $1.48 per ton, and in the North Central area at $1.29; but the Northeast, Southeast, and Southwest showed increases of seven, five, and three cents a ton, respectively, to $1.59, $1.82, and $1.33 per ton.

Wages Continuing wage increases were not missing from the cost picture in the sand and gravel industry for 1955—the average wage having increased 10 cents to a new level of $1.68 per hour. The average by section was: Northeast, 9 cents—to $1.71; Southeast, 24 cents —to $1.61; North Central, 10 cents —to $1.69; Southwest, 8 cents—to $1.18; and West, 13 cents—to $2.24 hourly.

The average number of employees per answering plant was 17; however, that figure represents a middle ground in the spread between an average of 9 employees per plant in the Northeast to 26 in the West. Plants reporting from the North Central, Southeast, and Southwest sections had an average of 10, 22, and 20 employees, respectively.



Production of stone (including crushed, broken, and dimension) in the United States, 1932-1955 (includes both commercial and non-commercial operations). Note: 1932-1953 figures are based on latest Bureau of Mines publications. 1954 and 1955 figures are derived from Pit and Quarry's latest annual questionnaire survey.

Outlook Any attempt to forecast the volume of business which may be expected by the industry in the next 12 months would be somewhat precarious if based solely on the percent of increase (or decrease) presented in the returned questionnaires. However, when those figures are considered in the light of the numerous expansion projects and new plant plans also noted on the returns, the picture is less nebulous.

A summary of the operators' estimates indicate that 1956 will establish another production record in exceeding the predicted 450,000,000 tonnage of last year. This is based on the fact that 48 percent of all answering producers expect an increase, while only 1 percent anticipate a decline. Another 40 percent expected demand to remain constant, and 12 percent indicated uncertainty on the question. Individual estimates of the gain which may be realized in the coming year ranged from 5 to 100 percent. The over all average, however, was slightly under 20 percent.

Excepting the 1 percent cited above, operators from all sections of the country were expecting a favorable future. Returns from the Northeast, North Central, and West were particularly optimistic—last year the Western producers exhibited least optimism. This is probably rooted in the 8 and 11 percent gains enjoyed in the North Central and West sections in 1955. As might be expected, reasons given in support of expected greater output were largely based on new highway work and heavy construction.

It was suggested above that predictions of higher production assume greater significance when coupled with information concerning plans for expansion within the industry. In the Northeast, North Central, and West, respectively, 25, 23, and 14 percent of the answering plants planned to expand capacities, while a total of 15 percent in those areas were contemplating construction of new plants. About 25 percent of the producers expect to revamp existing pit and processing equipment or to add to the latter. Twenty-two percent stated that they planned to acquire new pit equipment.

In answer to a question on the subject of the highway budget for 1956 (and the following 10 years), 12 percent of the Western operators, 25 percent in the Northeast, 38 percent of the North Central, and 50 percent of those answering from the Southwest expected that program would cause them to expand capacity from 10 to 30 percent.

1953 Statistics Sand and gravel production in 1953 totaled 440,089,225 short tons valued at $374,517,760 as per the Bureau of Mines Mineral Market Report for 1953 on these materials. Those figures represent an increase of 1 percent in tonnage and 6 percent in dollar value over the corresponding amounts in 1952. Of the total production, 70 percent was produced in commercial operations and the balance by plants operated by, or for, federal, state, county, and municipal government agencies.

As in 1952, California and Michigan led the other states with 13 and 7 percent, respectively, of total do-

mestic output. In order of rank, Ohio, Wisconsin, New York, Illinois, Minnesota, Texas, and Pennsylvania comprise the balance of the nine states whose combined production exceeded 50 percent of the total output.

Of the 308,586,351 tons of sand and gravel produced by commercial operators, 124,932,035 were used in paving—about the same percentage (42) as in the previous year. However, the 142,316,626 used for building represented a 3 percent gain and took 46 percent of the total commercial output. Railroad ballast—4 percent, and industrial uses—8 percent, complete the disposition of production.

In 1953, processed sand and gravel—washed, screened or otherwise prepared—represented 90 percent of the total commercial production (the same as in 1952) and had an average value of $1.04 per ton—which was an increase of 2 cents over the previous year. Unprepared bank run material, while selling for 72 percent less at an average 75 cents per ton, was 23 cents per ton higher than in 1952.

Trucks moved 43 percent of commercial production in 1953, and 17 percent was shipped by rail. The remainder was transported by waterway or unspecified methods.

N.S.G.A. Survey The National Sand and Gravel Association conducted its second annual survey during the past year, and covered 1954. Questionnaires were returned by 553 companies who reported a production of 186,844,448 tons. The results were published in May 1955, and the report reviewed in an earlier issue of PIT AND QUARRY (July 1955, p. 168).

CRUSHED STONE

A year ago it was predicted here, in revising a prior estimate, that 1953 crushed stone production would top that of 1952 by several million tons. As a matter of fact, the Bureau of Mines' latest tabulation (1953) records 304,496,233 tons for that year—an increase of 2 percent over 1952. The 310,000,000 tons estimated for 1954 in the last survey (January 1955) is revised upward at this writing by taking into consideration the average 3 percent gain expected by plants reporting on this latest canvass. The latter would indicate that output in 1954 was nearly 313,000,000 tons. Although the producers have indicated that 1955 probably gained less than 1 percent over 1954, they estimate a 4 percent rise over the last known total in 1953—thus pointing out the possibility of attaining a production of 316,000,000 tons during the past 12 months. This draws support largely from the substantial gains anticipated in the Southeast—19 percent, North Central—7 percent, and Southwest—11 percent. It is possibly significant that the greatest decline expected (in the Northeast) was one of less than 1 percent.

Comparison of 1954 and 1953 estimates in all sections furnishes background for a continuing rise since only one area—the West—did not gain ground over the earlier year while the other sections indicate 3 to 13 percent advances.

Hourly Capacity As of late November, 1955, the survey shows that in general hourly plant capacity had increased 15 percent over that same month in 1954. Figures given ranged as high as

An aerial view of the Presque Isle Corporation's quarry and fluxstone preparation facilities at Presque Isle, Mich. This plant is producing 5,000,000 tons annually.

The new Cedarville, Mich., plant of the Michigan Limestone Division, United States Steel Corporation. Crushing and screening houses are seen in the background, stockpile areas to the left, and the dock on the right.

1500 t.p.h. in a few instances but the average remained at about 200 t.p.h. By sections the following increases were given: North Central—14 percent, Southeast—43 percent, Southwest—50 percent, and West—7 percent. In the Northeast the average dropped 10 percent.

Although the average annual operating period for crushed stone plants is usually longer than for sand and gravel operations—due to greater percentage of the latter that employ washing facilities, and operate in wet pits or with dredges—the average period this past year was nearly the same for both materials—about 10 months. By sections the average operating periods were: 9.3 months — Northeast, 11.3 — Southeast, 8.6—North Central, 9.2—West, and year-round in the Southwest.

Selling Price Comparison of survey information on sales values by sections indicate that, as in the case of natural sand, the North Central area had a drop of a few cents per ton in 1955 from the 1954 average of $1.40 per ton. In the past year the average price in the Southwest also dropped—to $1.40 from $1.50 per ton. The country-wide average was also down (but only about 1 cent) to the current figure of $1.55 despite gains in the other sections of two cents (West), five cents (Southeast), and seven cents (Northeast). It must be borne in mind that the above figures are presented as reported in returned survey forms and may not be considered representative of the experience of all producers.

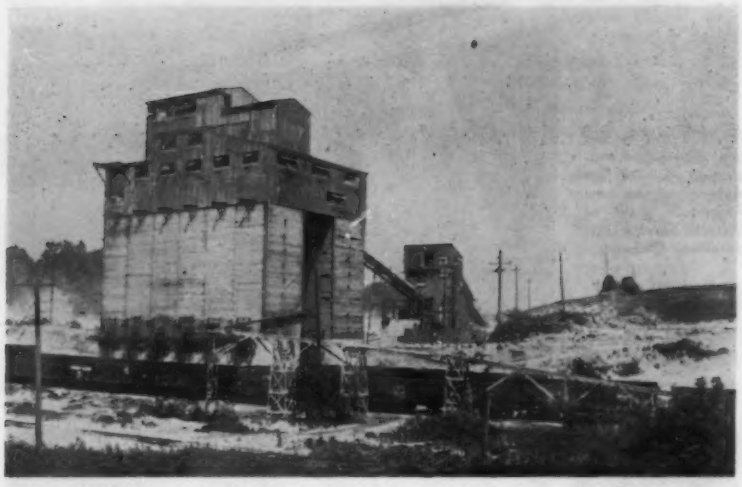
Wages Continuing the upward trend of average wages in the crushed stone industry, 1955 returns show that hourly pay has risen slightly over 1 percent to the current average of $1.51 per hour. Increases stated ranged from 4 to 11 percent, and by region they were: Northeast—10 percent, Southeast—11 percent, North Central—4 percent, Southwest—10 percent, and West—9 percent. Also by geographic area, figures furnished by answering producers show the following current rates: Northeast—$1.65, Southeast—$1.17, North Central—$1.49, Southwest—$1.21, and West—$1.90 per hour.

With respect to the average number of employees per plant, the two southern sections and the West show a substantially larger figure. The overall average was 30 men per plant, and sectional breakdown showed the following: Northeast—36, Southeast—19, North Central—26, Southwest—47, and West—37.

Concrete Service Company's new sand and gravel plant near San Jose, Calif. This operation produces over 150 t.p.h. of sized and washed material.

Outlook As a natural parallel to the optimism expressed by sand and gravel producers the picture drawn from estimates furnished by answering crushed stone operators is very favorable. Here, again, the plans indicated concerning physical expansion and new plant construction proposed for the coming year form a good foundation for the estimates made within the industry.

In each section of the country an average of over 40 percent of the answering plants expected 1956 to improve on last year. Only 2 percent were pessimistic and then only to the extent of anticipating a 15 percent decline. Those who indicated that last year's operating record would be repeated in 1956 comprised 32 percent, while 15 percent were uncertain and took no position. Concerning the degree of gain expected individual estimates ranged from 1 to 100 percent—the average of all



The new Material Service Corporation sand and gravel plant near Algonquin, Ill. Screening and washing facilities are in the top portion of the tall structure in the foreground. The crusher house is the smaller building in the background.

areas, however, was about 24 percent.

As in the sand and gravel survey, the West took a more favorable view than last year and expressed the most optimism—64 percent of the answering producers in that area anticipated an output averaging 15 percent higher. In the other sections, 56 percent of the reporting plants in the Northeast, 55 percent in the Southeast, and 41 percent in the North Central area expected to improve their 1955 record by from 19 to 30 percent. Reasons given in substantiation of these estimates included more road stone consumption, greater demand by steel, more housing construction (paralleling population growth), and improvement of production costs.

The views presented above—as summations of returned survey forms—derive considerable credence from the sizable group of operators who indicated plans for expanding capacity—this group containing one third of all those answering. In addition, another 19 percent reported that new plants were under construction or in the blueprint stage. In each section of the country, 18 percent or more of the operators planned to add new quarry equipment, and another 31 percent of all those answering expected to revamp existing quarry equipment.

1953 Statistics In the latest year (1953) for which the Bureau of Mines has compiled final statistics, the production of crushed and broken stone was 304,496,233 short tons valued at $423,535,036. This represented a gain of 2 percent in tonnage and 3 percent in value over 1953. Stone used only for concrete aggregates and road construction was 188,721,286 tons and constituted, as in 1952, 62 percent of the total output. Commercial operators produced 90 percent of the stone so used.

Other types of consumption, in order of volume, included metallurgical stone, 13 percent; railroad ballast, 7 percent; agstone, 6 percent; riprap, 3 percent; and alkali works, 2 percent. Metallurgical tonnage increased 17 percent over 1952, while rail ballast remained about the same. Although agstone represented 6 percent of the total the tonnage of this product decreased 13 percent from the preceding year.

Again in 1953, Pennsylvania and Ohio led all other states in production— each contributing about 8 percent of the total. In order of rank, Illinois, Michigan, New York, California, Missouri, Tennessee, and Florida complete the group of nine states whose combined output accounted for a little over 50 percent of all crushed stone produced. Limestone and dolomite continued to make up the greater part of the crushed stone sold—74 percent per the latest tabulation.

Analysis of transportation methods shows that trucking accounted for 50 percent; rail shipment, 31 percent, and waterways, 11 percent of commercial output moved.

AGRICULTURAL LIMESTONE

Statistics covering the use of agstone have not been compiled beyond 1954. However, with available figures covering that year, and general information from the industry, some general comparisons can be drawn.

It seems that the drop in production in 1954 from that in 1953 as estimated here a year ago did not fully materialize. In fact, the consumption of this material in 1954 was about 18,919,000 tons, or only 9 percent less than the 20,599,000 tons used in the preceding year (a 15 percent drop had been predicted). However, the former amount is still only 63 percent of the record production realized in 1947.

The classifying tower at the Fort Worth Sand and Gravel Company's new Quigley plant.

Despite the over-all drop indicated above, 13 of the 42 states reporting show increases in 1954 ranging from 2 to 148 percent over 1953, which effectively slowed the drastic rate of decline (25 percent) experienced two years previously. In view of the trend upward shown in those thirteen states (combined they accounted for 20 percent of production and use), it appears that 1955 may show an increase of 5 percent over the preceding year and register an output of nearly 20,000,000 tons.

It is difficult to develop a forecast for 1956 in view of the uncertainty as to the possibility and type of Congressional legislation, and the effect of the soil fertility bank idea that is currently receiving considerable scrutiny. However, there is sufficient optimism in the industry to indicate the possibility of another 1,000,000-ton gain by the end of this year.

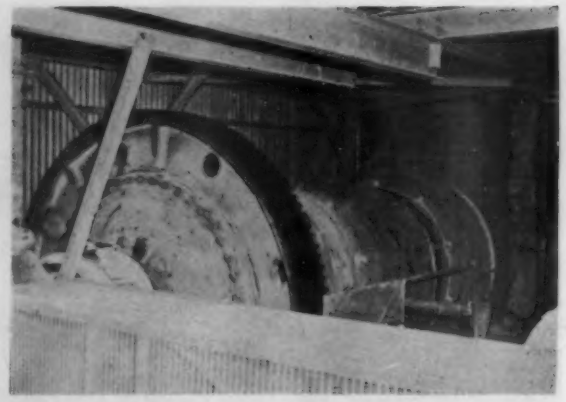
In 1954, Illinois and Missouri continued their previous lead among the agstone consuming states by using 2,614,823 tons (14 percent) and 1,990,341 tons (10 percent) of the total, respectively. Other leading states were Ohio—1,948,788 tons, or 10 percent; Indiana—1,813,402 tons, or 9 percent; Iowa—1,665,250 tons, 9 percent; Wisconsin — 1,133,151 tons, 6 percent; Kentucky—1,120,-880 tons, 6 percent; Pennsylvania—839,201 tons, 4 percent; New York—633,288 tons, 3 percent; and Virginia—602,699 tons, or 3 percent. These ten states repeated their 1953 performances in accounting for 75 percent of the total consumption.

Although 44 percent lower use (1954) was reported by Michigan, Oklahoma, Rhode Island, Tennessee, and Washington, their combined consumption represented only 3 percent of the total.

SLAG

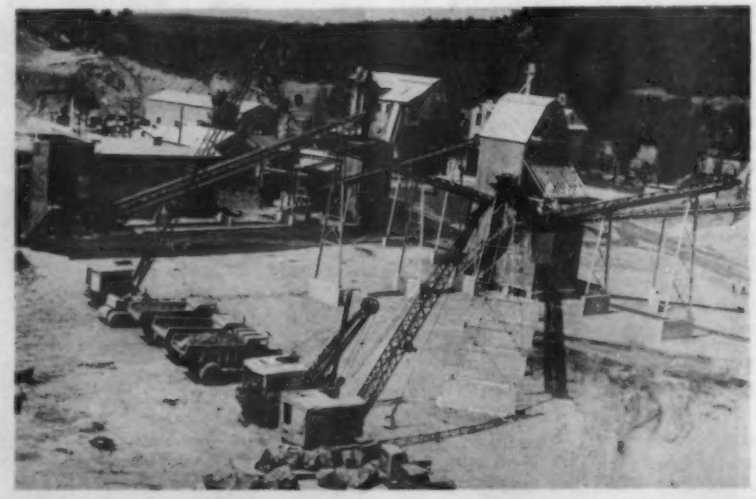
The production of processed iron blast-furnace slag remained at a high level in 1954, although somewhat lower than the record established in 1953, according to the latest Bureau of Mines Mineral Market Report. The 4 percent decrease from 30,511,-603 short tons in 1953 to 29,235,142 in the next year paralleled the reduced output of pig iron during the same period. Production in the latter year was valued at $39,476,408 or a decrease of about 1 percent.

The above and following statistics were compiled from a canvass conducted by the National Slag Association in cooperation with the Bureau of Mines and include the production figures of 45 companies operating 68 plants that process air-cooled slag, 15 plants processing granulated slag,



This rod mill is fed pea gravel for production of more fine material at the new Algonquin plant of Material Service Corporation, Chicago.

Rehabilitation resulting in scenic beauty, as accomplished by American Aggregates Corporation, Greenville, Ohio, at old sand and gravel diggings near Fort Jefferson, Ohio.



An overall view of the recently modernized Somerset Crushed Stone facilities at Bernardsville, N. J.

and 20 plants that produce expanded slag.

Analysis by types shows that of the total output, screened air-cooled slag comprised 76 percent; unscreened air-cooled slag, 3 percent; granulated, 11 percent; and expanded, 9 percent—these percentages being almost identical to the 1953 breakdown. Granulated and expanded slag showed 3 and 13 percent gains over 1953, while the air-cooled types dropped 7 percent (screened) and 4.5 percent (unscreened).

Ninety percent of the air-cooled slag production was used as aggregate and railroad ballast. Major uses for granulated slag were in the making of hydraulic cement—41 percent, road fill—38 percent, and concrete block manufacture—9 percent. The latter category accounted for 96 percent of the expanded slag output.

Slag is produced in 15 states, 3 of which (Ohio, Pennsylvania, and Oklahoma) account for two thirds of the total production—Ohio leading with 25 percent. The remaining third is produced in California, Colorado, Illinois, Indiana, Kentucky, Maryland, Michigan, Minnesota, New York, Tennessee, Texas, and West Virginia.

Transportation methods are comparable to those used in sand, gravel, and crushed stone; the breakdown showing 60 percent moved by truck, 38 percent by rail, and 2 percent by waterway.

The final figures for 1955 are expected by informed sources to represent a continuing high level of close to 30,000,000 tons. The latter, or perhaps slightly greater production, is again anticipated in 1956. In many areas, such as Cleveland, Birmingham, and Baltimore, a doubled output of slag would be required to meet demand. On this basis, an increasingly favorable market is almost certain, and it is expected that practically all slag produced in the United States will be utilized as mineral aggregate for years ahead.

LIGHTWEIGHT AGGREGATE

On the basis of reports received from the Bureau of Mines, coupled with information and reactions obtained from several industry associations, the encouraging growth of the lightweight aggregate industry recorded during the past three years shows no sign of abatement. This is a natural corollary to the increasing demands on the concrete industries.

In the survey of block producers which is discussed in the Concrete Manufacturer Section of this issue, there is indication that lightweight (8-in.) units accounted for 51 percent of the total estimated block production in 1955, and would mean that 1,326,000,000 of the lighter block were manufactured.

Although the yield in masonry units from one cu. yd. of lightweight aggregate varies with different materials (yields of 60 for expanded clay or shale, 56 for cinders, 50 for expanded slag, and 45 for pumice are considered representative) 55 units per yard is a reasonable average. On that basis the block industry probably consumed 24,000,000 cu. yd. of these aggregates in 1955. Beyond that figure, of course, is the volume of yardage used in plastering, insulation, and other uses, on which data is not available.

Industry production data, by regions, showing percentages of block output in which the various lightweight aggregates were used, are presented in the companion survey on concrete block and are not repeated here. According to that survey—on an industry which uses these materials in over half of its output—the possibilities for even greater expansion of lightweight aggregate production in 1956 are excellent.

Expanded Shale A Bureau of Mines Survey in 1953, coupled with other data received, formed the basis for last year's prediction of an approximate 2,250,000 cu. yd. production of this material in 1954—about 20 percent higher than in the preceding year.

Subsequent information gives that estimate strong support. The forecast of 10 to 15 percent higher output in 1955 appears to have been somewhat conservative, and the current picture indicates that the output attained during the past year may have been close to 2,600,000 cu. yd.

In view of reports on installation of new rotary kilns and new plants nearing completion at the time time of this writing, the anticipated increase of 10 to 15 percent seems well in line and could reach a new record of approximately 3,000,000 cu. yd.

Expanded Slag The former record high expanded slag output (2,285,758 short tons valued at $5,557,813) reported by the Bureau of Mines for 1953 was outdistanced by the 1954 production of 2,599,112 tons which was valued at $6,198,822. The latter figures represent, respectively, increases of 14 and 12 percent over 1953.

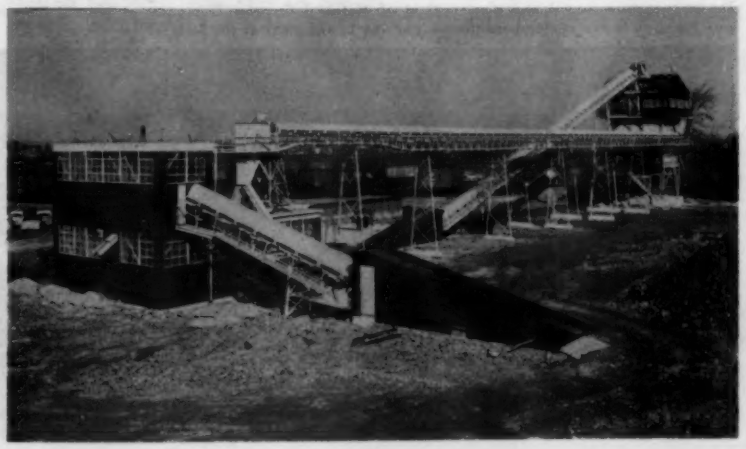
As previously, the bulk of this material was consumed in the manufacture of lightweight concrete block and as aggregate for lightweight concrete. Considering the fact that in many areas the demand has exceeded the supply of blast-furnace slag, there is good reason to expect another 10 percent increase in 1955.

Vermiculite The 1954 output of Vermiculite (from the Bureau of Mines most recent report on this mineral) was 195,538 short tons, screened and cleaned, with a value of $2,537,577. Although these amounts are respectively 6 and 4.5 percent lower than the corresponding figures for 1952, they represent 3 and 4 percent gains over 1953.

Production of crude ore is centered primarily in Montana and South Carolina. Small quantities, however, are mined in Arizona, Colorado, and North Carolina.

The canvassed output of vermiculite exfoliating plants, of which 50 are reported, indicated sales of 144,964 short tons at a $10,807,023 valuation. New facilities were erected in South Carolina and Montana.

The new lightweight aggregate processing plant of the Edw. C. Levy Company at Detroit, Mich.



Review and Forecast

Other Non-Metals

Healthy Growth Continues in Non-Metallics

By BUREN C. HEROD

OUTPUT of nonmetallic minerals—other than cement and aggregates—has, with few exceptions, continued to reach higher levels in 1955 than those previously established. This is evident in most of the Mineral Market Reports prepared by the Bureau of Mines for varying periods in 1955 on several commodities.

The production of a number of minerals attained a new record, while others that did not surpass previous performance still maintained a high level. Most of the few nonmetals that lost ground did so to a minor extent.

It appears that in some cases the records attained in 1954 will be broken in 1955 and in others that output will be maintained at, or near, peaks reached in the preceding year. In some instances, such as lime, there are indications of regaining all of the ground lost during the decline experienced between 1953 (record year for lime) and 1954.

Production figures are now available for a part of 1955 on several minerals, including lime—nine months, gypsum—nine months, sulphur—nine months, fluorspar—six months, and beauxite—nine months. Estimates furnished by interested sources on the foregoing minerals, and others, have been considered along with published data in arriving at estimates of the situation in 1955.

Based on the partial 1955 production reports in hand at the time of this writing, there is reason to expect that lime may well pass the record of 1953 (8,356,546 short tons, open market) and reach a new peak of 8,500,000 tons, or an increase of about 13 percent over 1954. In the second quarter last year, gypsum set an all time high for any quarter in the history of the industry. If the rate of increase holds for the last six months, a new record of about 10,500,000 tons will be realized. Sulphur, which shattered its 1952 performance with the 5,500,000-ton output of 1954, will apparently maintain about the same high level in 1955, and beauxite presents the same picture—it may be expected to equal the post-war record of 2,005,927 long tons set in 1954. The 20 percent drop in fluorspar production in 1954 that was anticipated in last year's review proved correct, but the current picture shows this product gaining ground to the point where it may pass the 1954 figure (248,983 short tons) by 1 or 2 percent.

While there are no published data on the following commodities in 1955, and consumption figures are meager, authoritative estimates show that phosphate rock production probably reached another record high despite a long strike in the Florida fields, and potash production increased 5 to 10 percent over 1954 (reaching about 3,500,000 short tons). Feldspar, estimated at about 415,000 long tons in 1954, may have dropped 5 percent or more last year due to greater imports of Canadian nepheline syenite. Graphite output (domestic), after suffering a sharp drop in 1954, may have increased 80 percent, based on the reopening early in 1955 of a mine in the Southwest. Tripoli production increased an estimated 25 percent in 1955 over 1954, while other natural abrassives probably maintained their 1954 level.

Due to a lack of 1955 information on a few other nonmetallics, the general pattern and trend for those may be determined from the details furnished in the latest (1954) Bureau of Mines reports. In the latter year production and sales of kyanite showed a decrease of 6 and 18 percent, respectively. Block and film mica fabrication totaling 1,736,973 lb. was carried out in the second half of 1954—a 16 percent increase over the first half of that year but

The new gypsum board and plaster plant of National Gypsum Company at Shoals, Indiana. Raw processing departments and raw stockpile are seen in the center background, and the board plant at the left.

10 percent less than the comparable period in 1953. The combined production of talc, soapstone, and pyrophyllite decreased 6 percent in 1954.

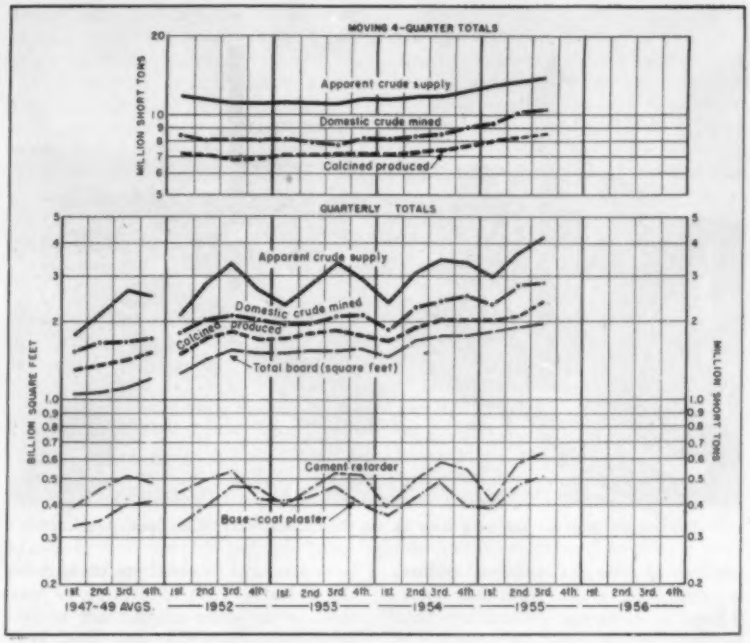
The overall picture then shows that nonmetallic industries are in the main enjoying continuing favorable prospects, and that the declines experienced by some are generally not drastic.

Lime Although the final statistics on lime production for 1954 illustrate a 10 percent drop from the previous year (when an all-time high was reached), the preliminary figures prepared by the Bureau of Mines for the first nine months of 1955 show commercial lime sales of 6,847,589 short tons, which represents a 24 percent increase over the corresponding period of 1954. In each of these nine months (excepting January 1955) the production has been from 19 to 29 percent higher than the same month in 1954, and on that basis the final figure for 1955 may possibly be about 8,500,000 tons—or an increase of 1 to 2 percent over the record 8,356,546 tons in 1953.

Analysis of the 1955 figures at hand show 78 percent of the nine months' output to be quicklime, and the remainder, hydrate. Percentages of the three quarters total by use, and comparison with that period of 1954 show, by rank: chemical and other industrial, 57 percent of the total (the same proportion as in 1954 but up 23 percent in tonnage); refractory dolomite, 26 percent (up 3 percent); building, 14 percent (2 percent less than 1954, but with 12 percent more tonnage); and agricultural lime, 3 percent (about the same ratio as in the earlier year, but with 4 percent less sales).

A summation of the latest final yearly statistics (1954) compiled by the Bureau of Mines is shown in the accompanying table. Except for a small quantity of captive tonnage, the figures are limited to open-market lime. Approximately 60 percent of the lime production tabulated is high-calcium and 40 percent high-magnesium.

Gypsum Production figures covering the first nine months of 1955 show the domestic mine production of crude gypsum soaring to a new record of 7,793,280 short tons—higher than any comparable period in the history of the industry. Output in the first three quarters of the year was 20 percent higher than in the same months of 1954. Final computation on the year is expected to show from 17 to 20 percent more production in 1955 than in 1954, to reach nearly 10,500,000 short tons.



Trends in the gypsum industry from 1951 to 1955.

Of all the gypsum products marketed, only two declined in use during the recorded part of 1955—plaster to mixing plants (down 22 percent), and sheathing (down 13 percent). However, these accounted for only a small percent of the total. All other products registered impressive gains, including sanded plaster (up 48 percent), lath (up 18 percent) agricultural (up 11), wallboard (up 19) roof deck formboard (up 2), portland cement retarder, and base coat plasters (up 8 and 6 percent, respectively).

In line with the expanded use of gypsum and gypsum products in the United States, imports during the period increased 13 percent over the comparable nine months in the preceding year and, coupled with the 20 percent gain in production of crude, raised the apparent supply of raw material by 18 percent to a total of 9,035,039 short tons. Production of calcined gypsum rose 16 percent to 5,655,032 tons.

The final annual figures for 1954 as developed by the Bureau of Mines show that for the fifth successive year the output of domestic crude exceeded 8,000,000 tons—reaching a point just under 9,000,000. Sales of wallboard showed the most significant gain over the preceding year by increasing $19,000,000. Considering the performance in the first six months of last year, as compared with 1954, the final figure on 1955 production of lath, wallboard, and sheathing may be nearly 7,000,000,000 sq. ft., or an increase of about 6 percent over the preceding year.

The outlook for 1956, as indicated by industry sources, is very favorable, the impetus toward expanded production being furnished by growing demands for gypsum products attendant on the overall construction picture. It has been anticipated that the possible decline in new home starts will be offset by an increase in non-residential construction and by increased activity in the home improvement market. The current multimillion-dollar expansion program on production facilities in the industry as a whole, along with the

OPEN MARKET LIME 1954

	Quicklime (Short Tons)	Percent of Total	Hydrated Lime (Short Tons)	Percent of Total	Total Open Market Lime
Agricultural	76,176	30	184,384	90	260,560
Building	194,566	17	954,353	83	1,148,919
Chemical	3,583,730	84	708,562	16	4,292,292
Refractory	1,792,760	100			1,792,760
	4,647,232		1,847,299		7,494,531

Two rotary kilns for calcining lime at the Paul Lime Plant, Paul Spur, Arizona.

number of new and enlarged plants, is predicated on that optimistic view. There is a strong probability that by the end of 1956 the output of gypsum board products will be nearly double that of the early post-war years.

Research activities in the industry have also been directed toward establishing and maintaining larger production and use. Notable developments have included a new and improved nail for the application of wallboard and a series of tests for the purpose of demonstrating the advantages inherent in poured gypsum roof decks. Several studies relevant to fire resistance and thermal properties, among other characteristics of various gypsum products, have been completed.

Sulphur Data on the production in the domestic sulphur industry through September, 1955, show that—after getting off to a slow start—the nine-month total lags less than 1 percent behind the comparable period in 1954. It is highly probable that the full year of 1955 will establish a tonnage figure equal to the 5,500,000 long-ton record of 1954.

By the end of September (1955) production of native sulphur amounted to 4,086,000 long tons, and recovered elemental sulphur (with purity of 97 percent or higher) to 294,800 long tons. These represented a decline of less than 1 percent, and a gain of 10 percent, respectively. However, shipments of the two classes had advanced over the same period in 1954 by an average of 11 percent.

The 5,500,000 tons shipped in 1954 were valued at $141,000,000—both amounts establishing records for the industry. It is interesting to note that, after some diminution of development in 1953, the next year saw capital expenditures of $9,000,000 for exploration and development, new construction, and acquisition of new or used equipment. Operations devoted primarily to production of sulphur (largely by the Frasch process) are located in only three states which, in order of output rank, are Texas, Louisiana, and California.

Imports of crude sulphur in 1954 amounted to only a small fraction of 1 percent of domestic production.

Fluorspar Encouraging activity developed in the fluorspar industry during the first two quarters of 1955, with a rate of output in the second quarter substantially above that reported for the corresponding period in 1954. The first three months last year realized a gain of 9 percent over the preceding last quarter of 1954, and was in turn surpassed by the April-June period by about 23 percent. Total production for the first six months of 1955 was 127,125 short tons; and following the record usage in production of hydrofluoric acid, along with increased consumption by steel plants, the final story on 1955 output may reveal a gain over the 1954 figure (248,983 tons) of 2 percent to about 254,000 tons.

The final analysis for 1954 shows a decline (from 1953) of 23 percent in production, 23 percent in shipments, 16 percent in imports, and 18 percent in consumption. These trends, however, appear to have been reversed, or at least halted, by the performance of the industry in the first two quarters of 1955.

Although the steel industry had long been the main consumer of fluorspar, it fell to second place in 1954, and as per the latest data at hand has remained there—hydrofluoric acid production now being the leader. In 1954 the percentage of total consumption by steel and acid was 41 and 47 percent, respectively. During the first six months of 1955, steel had very nearly caught up with acid usage and was only a fraction of 1 percent behind.

Bauxite From Bureau of Mines data covering the first three quarters of 1955, it seems evident that domestic bauxite production for the full year will perhaps equal the record high of 2,005,927 long tons (dried equivalent) set in 1954, although probably not passing it. This assumption is based on the (approximate) 5 percent drop of the nine-month total from the output attained in the corresponding period of 1954.

With respect to imports, these will probably be about 2 percent less than the record tonnage (5,291,862) of the preceding year but still 14 percent above the previous peak in 1953. The total new supply in the last year may reach 7,000,000 tons but would still be short of the 1954 figure by 4 percent.

In 1954 bauxite shipments to alumina plants and other consumers was valued at approximately $15,900,000—an 18 percent gain in value over 1953. As in preceding years, Arkansas again accounted for the bulk of domestic production—97 percent—Alabama and Georgia contributing the balance.

A final breakdown of the 1954 consumption by uses is not available at the time of this writing. However, it may be safely presumed that the principal requirements maintained the same relative positions as in the previous year, i.e., alumina about 88 percent of the total, and abrasives, 6 percent.

Imports for consumption in 1954 exceeded, by 20 percent, the previous record 4,388,623 tons of 1953. The proportion of imports in the total new supply for consumption was 73 percent—about the same as in 1953, but 6 percent higher than in 1952.

Surinam and Jamaica furnished by far the greater part of the tonnage imported, or 59 and 38 percent, respectively. The remaining 3 percent was supplied by British Guiana.

Phosphate While final production figures on phosphate in 1955 are not available, and con-

sumption information is meager, authoritative sources have estimated that marketable phosphate production has, at the least, been maintained at the high level realized in the preceding year, despite a strike in the Florida fields.

In 1954 a new peak marketable output of 13,821,000 long tons was realized which exceeded the previous record in 1953 by about 10 percent. Mine production exceeded 45,500,000 long tons for a 13 percent gain over the preceding period. All three producing areas—Florida, Tennessee, and Western states—which had enjoyed a striking increase in the previous year, suffered a 7 percent drop in 1954. The other two producing sections continued to gain—Florida up 6 percent, and Tennessee up 5 percent.

In 1953 import quantities were (at 100,000 tons) 8 percent lower than in 1952. However, the 122,000 tons reported in 1954 was a 22 percent jump. Exports—2,278,572 tons—were nearly 11 percent higher than in 1953. A 3 percent increase in apparent consumption (quantities sold or used by producers, plus imports and minus exports) was also recorded.

The 10,437,197-ton marketable output of Florida in 1954 constituted 75 percent of the total. Tennessee accounted for 11 percent, and the Western states—Idaho, Montana, Wyoming, and Utah—contributed the remaining amount.

Potash The United States production of marketable potassium salts again reached a new high in 1954—3,322,395 short tons (1,948,721 tons K_2O equivalent) for an increase of 2 percent above 1953 output. Sales and apparent consumption of potassium salts also increased by 10 and 8 percent, respectively, to 3,270,006 tons sold and 3,377,850 consumed.

Imports of potash materials were less in 1954, whereas exports increased. Imports totaled 225,230 short tons (119,220 tons K_2O), a decrease of 10 percent from 1953. West Germany, East Germany, France, Spain, and Chile supplied, in order, 41, 22, 15, 11, and 6 percent of the total United States imports. Exports increased 33 percent to 117,386 tons, with the major portion shipped to countries in this hemisphere.

Muriate of potash and manure sale output (combined) rose less than 1 percent over 1953, while sulphate of potash (including sulphate of potash-magnesia) gained about 14 percent.

New Mexico again led in domestic production by supplying 91 percent of the total. California and Utah contributed the balance.

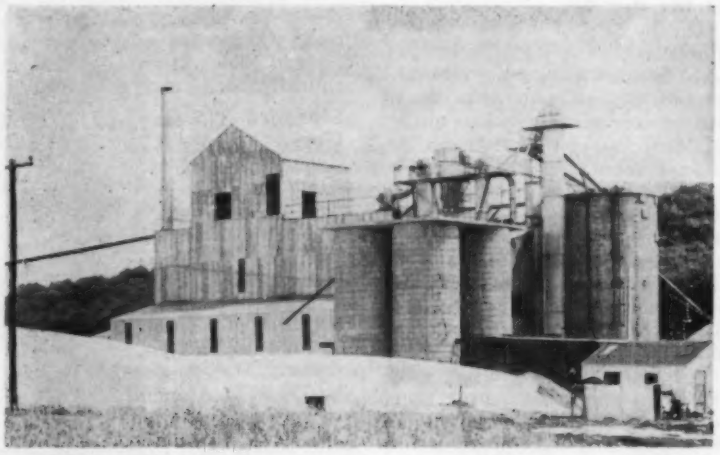
With respect to 1955, estimates at hand indicate that potash production increased between 5 and 10 percent over 1954 and may have reached a value of $78,000,000—or about 8 percent higher than the previous year.

Kyanite Domestic kyanite production showed a decrease of about 6 percent in crude and about 18 percent in refined material in 1954, compared with 1953. Sales of domestic kyanite decreased about 18 percent in quantity and about 17 percent in value for the same period. Since there were only two producers, Commercialores, Inc. (from deposits near Clover, S. C.), and Kyanite Mining Corp. (from a property near Farmville, Va.), the Bureau of Mines is not free to publish mine production statistics.

Exclusive of material purchased for the National Stockpile, and electrocast mullite, domestic kyanite consumption from all sources, including synthetic mullite, amounted to about 42,000 short tons in 1954. Due to the fact that the stockpile objective for kyanite was reached in 1952, this mineral was removed from the list of critical and strategic materials in 1954.

Graphite Following the end of the war in Korea, the natural graphite industry in 1954 was characterized by sharp decreases in production in the United States, Canada, and Mexico, a moderate decline in world production, and a substantial decrease in United States imports and exports.

Domestic production of crystalline flake ceased with the closing of mines in Texas and Alabama. However, one producer planned to resume production in Texas early in 1955. Pro-



The mill building and storage silos at the new sand operation of Silica Sand Corporation near Ottawa, Minn.

A view of Reynolds Talc Company's mill adjacent to the mine near Edwards, N. Y.

duction figures for 1954 have been withheld to avoid disclosure of individual operation. A comparison of consumption value, however, shows a decrease in 1954 of about 10 percent from the 1953 value of $4,779,000 (domestic graphite).

Imports decreased 20 percent in 1954 to 41,000 short tons, with all countries of origin (excepting Norway and British E. Africa) reporting decreases. For the first time, material was imported from Hong Kong. Exports of natural graphite dropped 55 percent from 1955 to 798 tons in 1954.

Mica Although a production analysis by tonnage and region is not available for a year subsequent to 1953, at the time of this writing (1953 production statistics were reviewed in last year's PIT AND QUARRY January issue), fabrication and consumption data has been prepared for the first and second half of 1954 by the Bureau of Mines.

On the basis of that information, it appears that consumption of block and film mica (muscovite ruby and nonruby) cut or stamped to dimension by domestic fabrications totaled 3,219,157 lb. This represents a decline of about 25 percent from the 4,300,000-lb. figure in 1953. Of the total, Lower than Stained quality ranked first, with 48 percent; Stained was second, with 47 percent; and Good Stained and Better third, with 5 percent. Electronic uses required 63 percent of the total block and film supply.

A total of 29 plants in nine states reported on fabrication in 1954, of which 18 plants in New Jersey (7), New York (7), and North Carolina (4) accounted for nearly 55 percent of the total.

Talc Combined mine production of talc, soapstone, and pyrophyllite in 1954 was 592,086 tons, with a value at the mine of $3,231,036—decreases of 6 percent in quantity and 8 percent in value from 1953. Pyrophyllite production increased 3 percent (to 126,702 tons) in 1954, compared with 1953, and exceeded the previous high (125,496 tons) recorded in 1952 by 1 percent.

Total sales by producers—572,871 tons—decreased 6 percent from the previous year, but the value increased by about 3 percent to $11,757,498.

In 1954 New York, California, and North Carolina continued to rank in that order in the matter of production and accounted for about 70 percent of the total. California ranked first in value of products, however, with $1,211,201 — about equal to the other two states combined. North Carolina continued as the major pyrophyllite producing state, and was followed by California.

Six industries consumed 83 percent of talc and soapstone sold by producers, including (in order of volume) paint—26 percent, ceramics—25 percent, insecticides—11 percent, roofing—10 percent, rubber—7 percent, and paper—6 percent. Of the total pyrophyllite sold, the following industries consumed 86 percent: insecticides (28), rubber (25), ceramics (21), and refractories (12).

Cement Review

(*From page* 157)

Standard Several months ago the Standard Portland Cement Co. (Diamond Alkali Co.) announced plans for a 320,000-bbl. increase at its Painesville, Ohio, plant. This $1,000,000 project includes a new clinker mill and auxiliary equipment. Completion of this program early in 1956 will give the plant an annual capacity of 1,900,000 bbl.

Standard Lime The Standard Lime and Stone Company, a 74-year old company operating nine plants producing cement, lime, crushed stone, dolomite refractories, etc., was taken over late in 1955 by the American Marietta Company in a $10,000,000 all-cash transaction. It was announced at once that the capacity of the 1,750,000 bbl. wet process plant at Martinsburg, W. Va., would be increased by 750,000 bbl. anually.

Texas The recently-formed Texas Portland Cement Co. is reported to be progressing rapidly with its plans for the construction of a 1,500-bbl. per day, $3,000,000 cement plant near Orange, Tex. Seashell and clay will be used as raw materials. A Kennedy-Van Saun kiln and other equipment has been ordered. Production is expected to begin late in 1956.

Universal-Atlas The Universal-Atlas Cement Co. is progressing satisfactorily with its expansion program, which includes two new plants and a new clinker grinding plant. The Universal, Pa., plant, which is essentially a new plant and replaces an old plant on the same site, went into full operation late in 1955. This plant has two 11- by 360-ft. F. L. Smidth kilns—which replaced 20 old 120-ft. kilns—coolers, mills, etc. Its capacity is approximately the same as that of the plant it replaced. This work, including electrical engineering, was done by the Macdonald Engineering Co.

At the Fairborn, Ohio, plant the installation of a new kiln and other equipment is scheduled for completion early in 1956. This will increase the capacity of this plant one-third. New 225,000-bbl. storage silos were built by the Macdonald Engineering Co. Improvements have also been made to the Independence, Kans., plant.

The construction of a new additional plant at Buffington, Ind., is scheduled for completion late in 1956. This 3,000,000-bbl. operation will increase the capacity at that location to 10,000,000 bbl. annually.

A new clinker grinding and packing plant at Milwaukee, Wis., is scheduled for completion early in 1956. This supplements an existing packing plant and will receive clinker by boat from Buffington.

There have been no further developments with respect to a proposed new $12,000,000 plant at Lorain, Ohio.

Volunteer The Volunteer Portland Cement Co., Knoxville, Tenn., has nearly completed the installation of new bulk loading silos with a capacity of 144,000 bbl. These will load direct to hopper cars inside the structure. This structure was designed and built by Crosby Construction Co.

Whitehall The Whitehall Cement Mfg. Co. early in 1955 completed a $2,400,000 reconstruction program at its Cementon, Pa., plant including a crushing plant, additional storage, coal mills, etc. There are plans for future expansion of capacity, including two new kilns, mills, cement storage, etc.

Wyandotte The Wyandotte Chemicals Corp., Wyandotte, Mich., announces an expansion program which will double its present capacity of 1,200,000 bbl. annually. Completion of construction is expected by the end of 1956.

A group of 45 outstanding experts will lead the discussions at the Seventh Plant Maintenance & Engineering Conference, which opens in Convention Hall, Philadelphia, Pa., on January 23. The conference will run for three days, and the Plant Maintenance & Engineering Show will run for an additional day.

GEORGE V. LANE recently was appointed regional manager of the United States Gypsum Company in California. Mr. Lane will make his headquarters in Los Angeles.

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28

Quarry Modernization At Oriskany Falls Plant Of EASTERN ROCK PRODUCTS

In the quarry of the Oriskany Falls plant. An electric shovel with a 4-cu. yd. bucket is loading one of the 13-cu. yd. side-dump trucks. Rear-dump (22-ton) units are also used.

Another ON THE SPOT Report

ABOUT three years ago officials of Eastern Rock Products, Inc., Utica, N.Y., decided on a major modernization of their 35-year old plant at Oriskany Falls, N.Y., mainly in the quarrying operation, to bring it to an average production of 600,000 tons of crushed stone per year. This represents an increase of approximately 15 percent over the previous output.

By ROY L. PECK

This step was taken in anticipation of furnishing a large quantity of the aggregates required for the concrete construction of the New York State Thruway. A considerable portion of this monumental highway passes reasonably close to the Oriskany Falls plant location.

In addition to this plant, Eastern Rock Products, Inc., operates a crushed limestone plant and bituminous concrete products plant at Prospect, N.Y., and sand and gravel plants at Boonville and Gravesville, N.Y. The concern also leases to another firm a company-owned quarry at Munnsville, N.Y. All these are points within a 25-mile radius of Utica, N.Y., Eastern Rock Products headquarters.

The Oriskany Falls quarry was operated for many years prior to 1920 by the Bardorf estate. Stone from it was used to construct the docks along the old Erie Canal, now only a reminder of past modes of transportation. Purchased by Eastern Rock Products, Inc., and operated continuously since that date, the quarry now has about 2,000 lineal feet of face averaging 120 feet in height. The formation of the stone is of the Oriskany limestone typical of the area. Overburden averages 40 feet in depth and consists of 20 feet of earth, 10 feet of Onondaga limestone, and 10 feet of sandstone. Check drillings across the present bed and adjacent areas assures the company an adequate supply of stone for many years.

Much of the output of crushed stone from the quarry for the last two years has necessarily gone into the concrete pavement construction of the New York Thruway. Hauls to various contracts along the route have averaged less than 50 miles from the various plants of the company.

Left: A rotary drill rig with 7¾-in. bits sinks holes to depths of 130 ft., averaging 30-ft. spacing and 24-ft. burden.

Right: This crane, with a 6,000-lb. drop ball, is used for secondary reduction.

In addition to the aggregate production, about 60,000 tons are sold each year for bituminous concrete roads, and from 50,000 to 75,000 tons is ground in a separate plant to New York State Agricultural Lime Specifications. The company has an up-to-date black-top production plant a few hundred yards up the road from the Oriskany Falls unit.

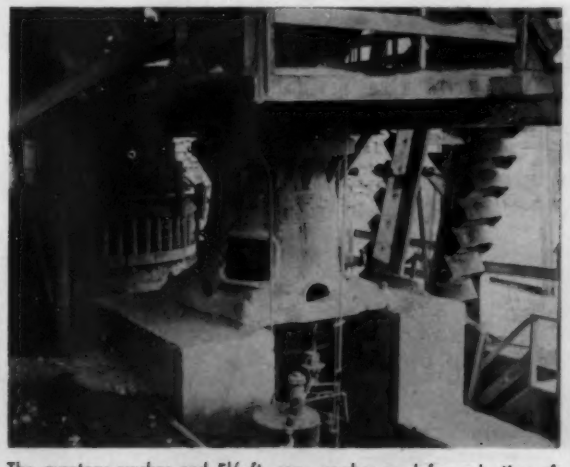
All commercial material sizes are produced at an average rate of 290 t.p.h., and this entire output can be washed through rotary scrubbers. Facilities permit the loading of cars on the New York, Ontario and Western Railroad on the double-track siding serving the plant, or on trucks. U.S. Route 20 is only a few miles south of the site, and there are many good secondary roads nearby.

Topographically, a high shelf of stone has been left along the east side of the quarry in the many years it has been operated. This shelf carries the paved highway in front of the plant and bisects the quarrying and primary-secondary crushing operations from the screening-loading-stockpiling portion of the plant. The ground falls away very sharply east of the structures on top, to the bed of a north-south creek. This stream provides a convenient source of wash water in an impounded pond adjacent to the scrubbing equipment, stockpiles, and loading bins, which are located on these lowest areas of the property.

This natural "stepped-down" cross-section character of the land affords an opportunity for efficient working of the quarry, of gravity-actuated flow in handling materials to the lower areas, and for future

A general view of the Eastern Rock Products quarry operation at Oriskany Falls, showing the formation and the stock of working rock.

The conveyor from the primary to the secondary crusher, and the return chute to complete the circuit of overage from the 6-in. grizzly above, which by-passes the primary.



The gyratory crusher and 5½-ft. cone crusher used for reduction of material off and through the scalping screen. These crushers discharge into closed circuit with the primary crusher.

One of the 5- by 14-ft. triple-deck screens, having ⅛-in. heated cloth on the bottom deck for the purpose of preventing screen blinding by fine material.

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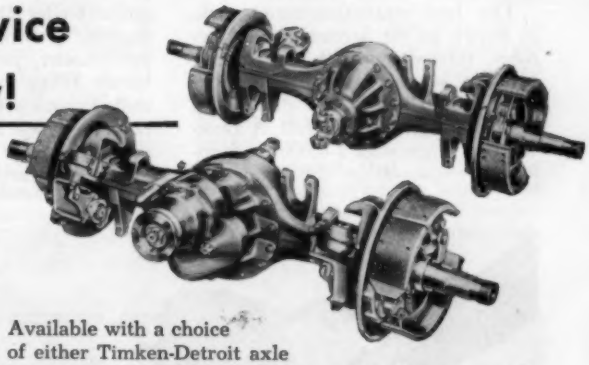

This new lightweight tandem brings two important new advantages to construction truckers – greater payload capacity† and much easier maintenance.

More than two hundred pounds lighter than any other unit of the same capacity, this new TDA tandem will save a trucker 7,500 deadweight ton-miles during an average 75,000 mile year. This means more payload and profit where it counts.

Almost all of the parts – gears, pinions, differentials and brakes – used in this new tandem are interchangeable with parts from Timken-Detroit® standard single axles. This assures operators less down time . . . faster, simpler, more economical service . . . and smaller replacement parts inventory.

Available with a choice of either Timken-Detroit axle connecting groups, or brackets to accept other approved chassis hook-up parts. Plus these additional advantages with the Timken® lightweight tandem:

TDA Inter-Axle Differential Divides Torque Evenly Between Axles . . . and yet permits wheels of one axle to revolve faster or slower than wheels of the other axle. This means both axles are always doing equal amounts of work . . . driving parts and tires last longer.

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Big, Dependable Hypoid Gears rotate in conventional direction for maximum gear and bearing life.

This new highway tandem insures new payload profits, faster, easier service and operating economies for construction truckers everywhere. For complete information contact your nearest vehicle dealer or branch.

*based on 75,000 highway miles a year.
†for the same gross vehicle weight.

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quarrying below the present bed, without too much up-haul when such areas are developed. It also minimizes final disposal of overburden waste.

Drilling is done with a Joy 58-BH rotary rig having 7 ⅜-in. bits. Holes are sunk to a depth of 103 to 130 ft., and average 30 ft. in spacing, with a 24-ft. burden; the pattern naturally varies with the character of the rock encountered. At the time of our visit, Hercules desensitized dynamite was being used. A typical charge consisted of 900 lb. of Hercules EP 152, 25-lb. cartridges in the lower half of the holes, and 800 lb. of Titan No. 2 cartridges up to 15 ft. from the top. Stemming of this remainder is done with minus ½-in. stone. Yield averages 4.2 tons of rock per lb. of explosive.

The horizontally-laminated rock, as shown in the accompanying pictures, interwoven with a distinctly vertical segmentation, necessitates some dropball reduction after initial blast dislodgement and fall. A Link-Belt K1 crane with a 6,000-lb. dropball is employed on this reduction.

Prior to the modernization of the plant, a Marion Model 37 shovel with a 1¾-cu. yd. bucket and a Link-Belt K-55 shovel with a 2-cu. yd. bucket were used for loading a number of small-capacity truck units in the quarry. These two shovels have been replaced with one Marion 111-M electric shovel with a 4-cu. yd. bucket, operating from 2,300-volt d.-c. current. This unit loads a Euclid 28-FD, 22-ton capacity rear-dump and three Easton 12-cu. yd. side-dumps which are now used for hauling rock from the shovel to the primary crusher. The round trip haul is less than 2,000 ft. A 1½-cu. yd. Model 15-A Pettibone-Mulliken loader is used to clean up under the shovel and around the quarry. These trucks dump their loads into a 48-in. by 13-ft. Kennedy-Van Saun apron feeder ahead of the primary crusher, a 36- by 48-in. Buchanan jaw crusher, powered by a 125-hp. motor. When the feeder was first installed, jams occurred in the 40-ton hopper, which of course, hampered production. A "jam breaker" was installed at the receiving end of the hopper—a development of the company. After this, jams no longer occurred.

The breaker is essentially a hydraulically-operated ram mounted in a recess along the back of the feeder hopper. When a jam of rock occurs, the ram, operated by pushbutton, slowly pushes a swinging pendulum into the stone mass, thereby breaking the jam; it then returns to the recess. According to J. V. Owens, vice-president of the company, the materials for this device cost around $1,200. Prior to the installation, application was made for a patent on the breaker.

A 6-in. grizzly by-passes fine stone around the crusher. The side-dump truck units are unloaded at the primary crusher by means of a 25-hp. Easton hoist equipped with a truck-tilt dump arm. Discharge of the primary crusher is onto a 36-in. by 160-ft. conveyor belt which carries materials into a 5- by 12-ft. double-deck W. S. Tyler Ty-Rock scalping screen. Material over the top deck of this screen is further reduced as it passes through a 14-in. opening to a Ken-

The main conveyor belt emerges through the rock wall to the secondary crusher building. It crosses the road to further reduction points.

The upper crusher and screening building and the truck-loading bins for aggregate sizes and material for the black top plant.

The two washer structures located on the lower level. Each has a bin for cars or truck loading. Water for washing is taken from the impounded pond (background).

Harry E. Townes, superintendent (left), and William Lapree, stock clerk.

nedy gyratory crusher driven by a 50-hp. motor. Material through the top deck and retained on the bottom deck is also reduced but by a 5½-ft. Symons crusher with a 250-hp. motor drive. These crushers discharge onto a 30-in. by 50-ft. conveyor in closed circuit with the 36-in. belt from the primary crusher to the Ty-Rock screen.

Most of the material passing through the bottom deck of this scalping screen is considered a finished product and is carried to a secondary screening plant by a 30-in. conveyor belt. A portion of the minus 3½-in. material is belted to a Kennedy No. 37½ crusher with a 50-hp. synchronous motor drive. After passing through this crusher, the material is elevated by bucket line and the minus ⅛-in. dust is removed by screen into a storage bin. This dust is used primarily in the black top operation. The plus ⅛-in. material is returned to the 30-in. belt and thence to the secondary screening plant.

The 30-in. belt to the secondary screening plant discharges on a Tyler 5- by 14-ft. three-deck screen. This screen is equipped with 2-in. square openings on the top deck, ¼-in. heavy-duty, Ty-Rock cloth on the middle deck and ⅛-in. square heated cloth on the bottom deck. Plus 2-in. material travels *via* chute to side hill storage. The minus ⅛-in. material is conveyed to the agricultural lime plant for grinding and further processing, or belted to side hill storage. The minus 2-in. plus ⅛-in. material is passed over several vibrating screens and minus 2-in. plus 1-in., minus 1-in. plus ½-in., minus ½-in. plus ¼-in., and minus ⅛-in. material all travel *via* chute to side hill storage.

Excess plus 2-in. material over the 5- by 14-ft. screen is chuted to a silo feeding a Kennedy No. 49½ crusher. This machine recrushes that size and discharges to a bucket elevator feeding a three-deck 5- by 14-ft. Allis-Chalmers Ripl-Flo screen. This screen is equipped with ½-, ¼-, and ⅛-in. cloth, and the separated sizes travel by chute to bins beneath, where the material is loaded for the black top plant or to customer's trucks.

Stone in the side hill stockpiles is reclaimed and travels by tunnel and inclined belt conveyors to washing bins equipped with rotary scrubbers, and final sizing screens. One of the washing bins contains a 4- by 12-ft. double-deck Tyler screen and the other bin a triple-deck Ty-Rock 5- by 12-ft. screen. Washed material from these bins is loaded direct to railroad cars or trucks for delivery or to stockpiles. Material is loaded for rail or truck delivery with a 1¼-cu. yd. Lorraine shovel, a ¾-cu. yd. Bucyrus-Erie crane, and a Haiss bucket loader.

Power for the operation of the plant is purchased from the New York State Gas and Electric Company at 4,600 volts. It is reduced by means of transformers to 2,300 volts for the Marion shovel, and to 440-volt plant current. Motors of capacities from 1 to 250 hp. are General Electric, Westinghouse, or Allis-Chalmers. Conveyor belts are either Hewitt-Robins or Goodyear units.

Thirty-six employees work 55 hours per week (10 hours per day and 5 hours on Saturdays). A breakdown of the total number of men employed shows that quarrying operations require 11, maintenance 4, crushing and screening 4, loading (including 4 truck drivers at the loading bins) 13, and office and miscellaneous 4.

Officers of the corporation include the following: Harold V. Owens, president: C. A. Munz, vice-president and sales manager; J. V. Owens, vice-president and production manager; and H. H. Kirwin, treasurer. Harry F. Townes is superintendent of the Oriskany Falls Plant.

Output of Potassium Salt Reaches Record High in 1954

Production of marketable potassium salts in the United States reached a new high in 1954, increasing 2 percent above the 1953 production, according to reports by producers to the U. S. Bureau of Mines.

Sales and apparent consumption of potassium salts both increased in 1954—10 and 8 percent—respectively, as compared with 1953. Stocks in producers' hands at the end of 1954, 11 percent above the previous year, amounted to 524,328 short tons.

Formation of a new concern to process and market a soluble soil "amendment" has been announced near Salida, Colo. The new firm, Mineral Aggregates Corporation, is headed by C. George Swallow. Mr. Swallow stated that the firm has leased a hammermill to process the ore, which contains about 37 percent sulphur and about 26 percent calcium.

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MEN OF THE INDUSTRY—

A. R. FISHER AND K. V. LINDELL OF JOHNS-MANVILLE

A. R. FISHER and K. V. Lindell are in the spotlight of the Men of the Industry series this month. They have helped to shape the future of one of the largest organizations in our industry.

A. R. Fisher, president and director of the Johns-Manville Corporation, has devoted his career to familiarizing himself with every phase of Johns-Manville production. He is also an outstanding authority on the mining and exploration of asbestos fibre, key raw material in the more than 400 different lines of products manufactured by the firm.

Prior to joining Johns-Manville in August, 1923, as superintendent of the asphalt roofing department for the company's plant at Waukegan, Ill., Mr. Fisher had been a superintendent with the Barber Asphalt Company at Perth Amboy, N. J., and manager with the Stowell Manufacturing Company, Jersey City, N. J. Since his first position with J-M at Waukegan, he has also served in an executive capacity at the company's plants in Lompoc, Calif., and Manville, N. J.

In November, 1937, Mr. Fisher was transferred to the company executive offices in New York City as vice-president of Johns-Manville Products Corporation. Eight years later he was made a vice-president of Johns-Manville Corporation; and in January, 1946, he was appointed senior vice-president for production and acting general manager of the company's Asbestos Fibre Division. In January, 1951, Mr. Fisher was elected a director of J-M, and in March, 1951, he was named president of the corporation.

A native of New Brunswick, N. J., Mr. Fisher was graduated from Rutgers University with a Bachelor of Science degree in engineering, and served as an officer with the United States Army Field Artillery during World War I. He is a member of the board of trustees of the Industrial Hygiene Foundation of America.

Karl V. Lindell is vice-president of Canadian Johns-Manville Company, Ltd., and general manager of the company's Asbestos Fibre Division, a position to which he was appointed on November 21, 1951.

Mr. Lindell was born in Ashtabula, Ohio, and was graduated from Michigan College of Mines in 1928

A. R. Fisher

with a degree in mine engineering. His first position was with the Royal Tiger Mines in Colorado. In 1929 he became associated with International Nickel Company of Canada, Ltd., where he held positions of responsibility at the company's Frood mine and the Copper Cliff general headquarters in northern Ontario. He was made assistant to the general superintendent of mines for International Nickel in 1943.

In 1943 International Nickel sent Mr. Lindell to Petsamo, Finland, to develop a program for opening a nickel mine on which the company subsequently spent $7,000,000, only to have the property seized by the Russians in 1940, during the Russo-Finnish War.

K. V. Lindell

Mr. Lindell joined Canadian Johns-Manville in 1945 as mine superintendent of the company's Jeffrey Mine underground operations at Asbestos, Que. He was later appointed plant engineer for the company's operations at Asbestos. In January, 1950, he was made manager of the Jeffrey Mine at Asbestos.

Mr. Lindell is a member of the Canadian Institute of Mining and Metallurgy, the American Institute of Mining and Metallurgical Engineers, the Corporation of Professional Engineers of the Province of Quebec, and the Canadian Manufacturers' Association.

New Installations in Yugoslavia To Increase Cement Output

Production of cement in Yugoslavia during the first nine months of 1954 totaled 1,043,000 metric tons. Total output for 1953 was 1,281,000 tons. A decrease in the price of cement, ranging from 8 to 12 percent, was announced by the Prvoborac cement works in Solin.

Two new cement plants are under construction in the country, and a new kiln was recently put into production at a plant at Podsuded, near Zagreb.

Scottish Firm Plans Chain Of Canadian Gypsum Plants

Premier Joseph R. Smallwood has announced that management of the government-owned Atlantic Gypsum Limited, on Newfoundland's west coast, has been taken over by Belroc Gypsum Limited, of Glasgow, Scotland.

Belroc plans to set up 15 gypsum processing units in eastern Canada. Three of the new plants will be built in Newfoundland.

Four cement storage silos were recently completed at Harbor Island, off Seattle, Wash., for Olympic Cement Storage, Inc., a subsidiary of the Olympic Portland Cement Company. Each of the silos is 90 ft. high, 30 ft. in diameter, and will hold 10,000 bbl. of cement.

NEWEST PAYLOADER® MODEL sets the pace for a bomber base

Here is the starting point of Peter Kiewit Sons "production line" for concrete placing at a large bomber base — a Hough model HH "PAYLOADER" tractor-shovel feeding a belt conveyor with sand and gravel from adjoining stockpiles. The task of the "PAYLOADER" is a crucial one, because failure at this point would bring the entire concrete-placing operation to a standstill.

Peter Kiewit Sons, one of the largest and most progressive of heavy contractors, have been using "PAYLOADER" tractor-shovels for years on their contracts all over the United States. You too, can depend on the proven performance of "PAYLOADER" tractor-shovels and on the large and reliable Distributor organization that sells and services them, both at home and abroad.

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SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

This model HH is one of three completely-new 4-wheel-drive "PAYLOADER" tractor-shovels. They all have a sensational new kind of bucket arm design that provides 40 degrees of bucket tip-back at ground level, powerful pry-out action plus unusual safety, stability and visibility factors.

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Send data on new 4-wheel drive units

- ☐ Model HU—1 cu. yd.
- ☐ Model HH—1½ cu. yd.
- ☐ Model HO—2 cu. yd.
- ☐ Smaller "PAYLOADER" units

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State_____

Iowa Producer

(*From page* 114)

the crushing circuit. Material retained on the middle and bottom deck screens of the Kolman (plus ½-in. and plus 3/32-in. respectively) is discharged onto separate conveyors and carried to stockpiles. An 18-in. belt on a 50-ft. belt conveyor handles the minus 1¼-, plus ½-in. gravel, and a 40-ft. Kolman conveyor with a 14-in. belt carries the smaller product (minus ½-, plus 3/32-in.).

The minus ¼-in. material, passing the bottom deck of the Simplicity, bypasses the crusher and log washer and is flumed directly to a 32-ft. Eagle Iron Works scalping tank of 100 t.p.h. capacity that is supplied with water at 400 g.p.m. From the first four of the nine valves below this unit concrete sand is drawn off into a 32-ft. Eagle sand screw classifier using 400 g.p.m. of water.

This sand is then fed to an 18-in. belt on a 75-ft. Kolman swivel-mounted conveyor and carried at 335 f.p.m. to stockpile. The next three valves of the settling tank furnish mason sand to a 24-ft. single-screw Eagle fine sand classifier supplied with water at 300 g.p.m. This material is then taken to stockpile on a 35-ft. by 18-in. belt conveyor. Overflow from the scalping tank and fines from the last two valves are flumed to the lake in the former operating area.

While the plant is presently operating with a raw feed of 50 t.p.h., Mr. Vore states that it can easily handle twice that amount. On a seasonal basis, the pumping is generally started between April 15 and May 1, to continue until about November 1 of each year. While the average processed material stockpiles during this period contain from 5,000 to 6,000 tons, a winter stockpile of approximately 20,000 tons is established before plant shutdown.

A 60-hp. motor runs this 8- by 20-ft. log washer.

Two truck bins, one of 40-ton and the other of 50-ton capacity, are used for batching and straight truck loading. An American Standard scale with a weighing hopper is suspended below the 40-ton bin, and a Howe scale with hopper is hung below the larger unit. Two Koehring cranes are used for yard stockpiling. One, with a 1¼-cu. yd. clam is powered by a 185-hp. Waukesha gasoline engine, and the other, with a ¾-cu. yd. clam, is driven by a 135-hp. Wisconsin power plant. A ¾-cu. yd. P&H diesel shovel is used for direct loading.

Mr. Vore, in speaking of the 65-acre lake left from the former diggings, stated that stocking the area with fish has resulted in some fine piscatorial returns. It is evident in viewing the natural surroundings of the old operating area, and of the new, that in the future these locations could well be established as a picturesque recreation spot without an unreasonable expenditure of time and effort.

Don't Overpay Your Taxes!

(*From page* 112)

allowed to deduct it as an expense of the current year.

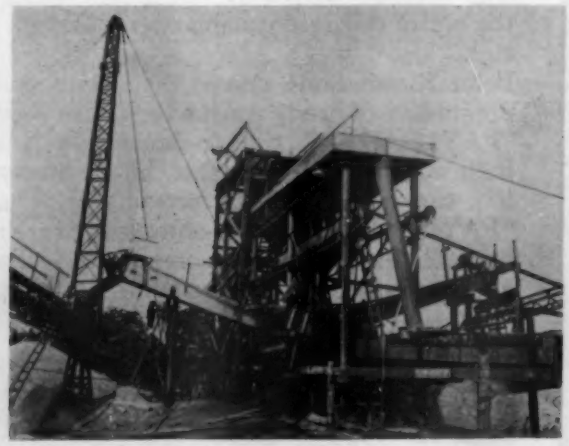
For example, you might have a furnace repaired and new radiators added. By separating the charges you can deduct the cost of the repairs in the current year, although the new radiators would be improvements subject to depreciation during their useful life.

Keeping Good Records Many deductions are lost through failure to keep adequate business records. Be sure that you have good records to show you what deductible expenses you have had, and to back up your deductions in case they are questioned by the government. This applies particularly to your out-of-pocket business expenses, such as travel and entertainment of customers, and to items which are deductible on your personal income tax return.

Good records and properly qualified professional tax assistance, at tax-filing time and throughout the year, are the keys to income tax savings.

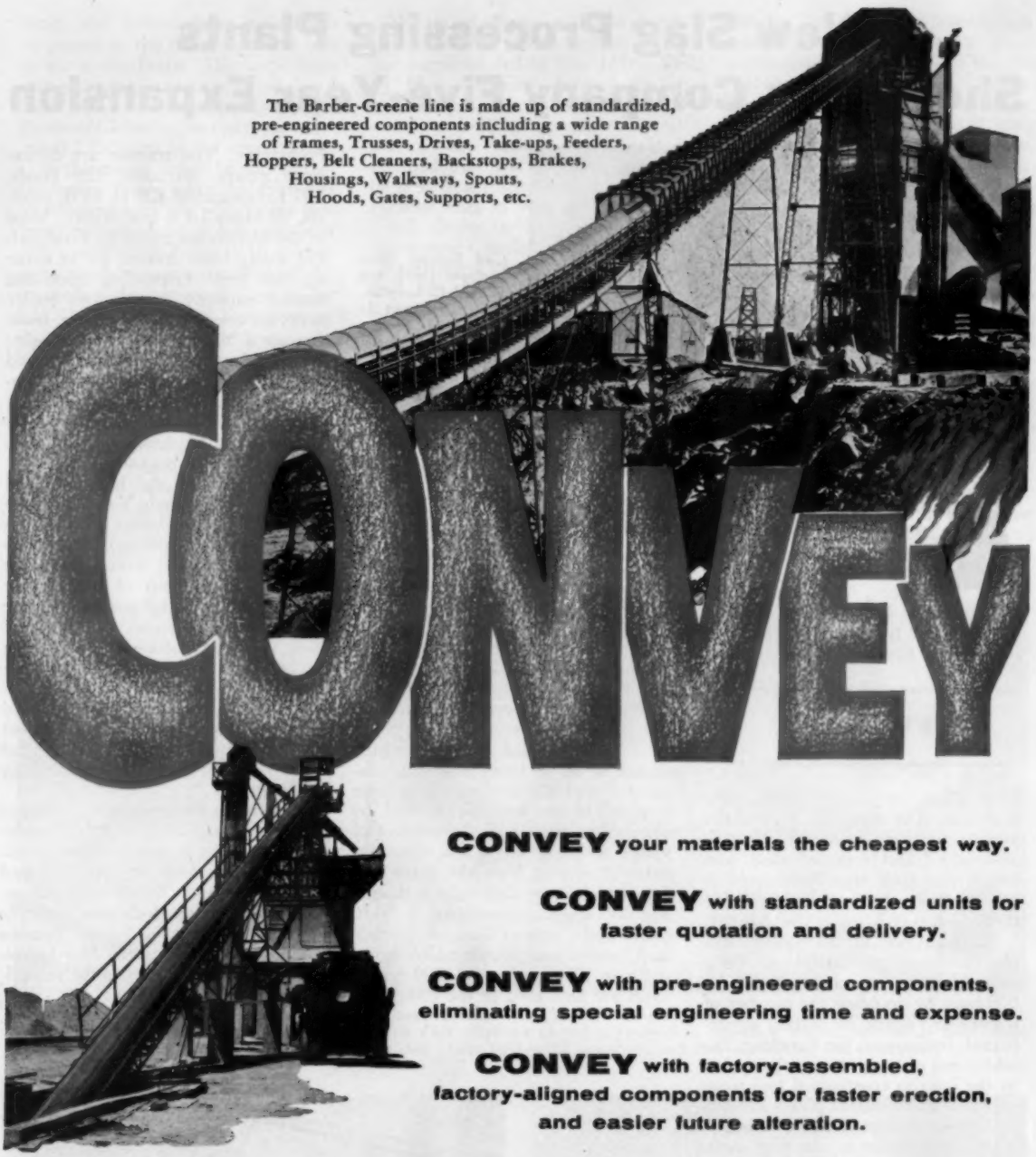
About 90 percent of the United States sulphur supply and one-half of the world supply comes from Louisiana and Texas.

Sand and gravel discharges from the pipeline to the top of the plant. A stockpile conveyor is at the left.



Sand passes through this scalping tank and screw classifier at the Flint Crushed Gravel Company.

The Barber-Greene line is made up of standardized, pre-engineered components including a wide range of Frames, Trusses, Drives, Take-ups, Feeders, Hoppers, Belt Cleaners, Backstops, Brakes, Housings, Walkways, Spouts, Hoods, Gates, Supports, etc.



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New Slag Processing Plants Show Levy Company Five-Year Expansion

Carl Koropp, plant engineer (left), and Edward C. Levy Jr., vice-president in charge of production and engineering.

Another ON THE SPOT Report

FIVE years ago* we described the extensive operations of the Edw. C. Levy Company, Detroit, Mich., in purchasing, hauling and selling blast furnace slag, mainly from the Ford Company's huge River Rouge plant. The

By ROY L. PECK

Levy plant, opened in 1949, now known as "Dix Ave. No. 1", was the initial unit which produced 500 t.p.h. of crushed and screened slag, and which was then considered—and is still so rated—the finest and probably the largest such plant in the industry.

In addition to increasing this plant's yearly production of 800,000 tons of processed slag to 1,800,000 tons, by doubling the number of screens to 12, and by adding appurtenant equipment for handling this additional output, the company has in the interim constructed two more complete and separate plants in nearby locations. One of these, "Dix No. 2", built adjacent to the first plant, processes expanded slag produced at the three Ford blast furnaces, into a lightweight concrete aggregate suitable for use in concrete products plants of all kinds. Another slag-processing plant has been built on the property of the McLouth Steel Company at Trenton, Mich. The output of slag from the Great Lakes Steel Company's four blast furnaces at River Rouge, Mich., originally crushed and screened by that company, is now processed entirely in the Dix No. 1 plant. Still another additional plant unit is contemplated at the Dix Ave. property. Many peak days of over 10,000-ton production have been reached at the original plant.

Dix No. 2 Plant

The new Dix No. 2 lightweight aggregate plant is located about three miles from the Ford blast furnace. The blast furnace slag is subjected to a heavy stream of water which causes it to be broken up into expanded globules containing a large number of air bubbles, formed by the steam created by the contact of water and hot slag. The resultant material is dug from the surge pits into which it has fallen, by a Koehring 605 dragline mounting a 50-ft. boom and a special 2-cu. yd. bucket, and loaded into double-trailer units.

Some 275 trucks and 200 trailer units are now used in the company's operations. The tractors are of various makes, including 125 Fords, 100 International KB 11 COE models, 30 Mack LF's, and others. Most of the trailers are made by Fruehauf, but many other models go to make up this fleet. Depending upon the tractor capacity, one or two trailer units are coupled to the tractor, making up a 30-ton load. At the lightweight plant these loads are dumped into a 14-cu. yd. underground hopper, or into stockpiles at ground level, for later feeding into the hopper by means of a Koehring 605 dragline with a 2-cu. yd. bucket.

Material from the hopper is fed through a Kennedy-Van Saun reciprocating plate feeder to a 36-in.-wide Goodrich conveyor belt moving at 250 f.p.m., which takes the slag up to the top of the crusher house. All material passes over the Dings magnetic pulley at the top of belt, the drive motor and pulley being located just below to allow some sag around the magnetic pulley to facilitate the collection and removal of iron particles. These are chuted to the outside of the building and then returned to the Ford Company as scrap iron.

The No. 1 conveyor belt discharges onto a Cedarapids horizontal double-deck vibrating scalping screen, which has 1½-in. mesh on the top and $\frac{5}{16}$-in. mesh on the bottom screen. Slag off the top deck goes into the primary crusher, a 5½-ft. Symons standard cone crusher. The 1½-in. to $\frac{5}{16}$-in. material goes to the secondary crusher, a Symons 4-ft. short

Screen house, showing main conveyor (inclined) and return conveyor to crusher house. Note structural support of belts with minimum of lost space.

*See PIT AND QUARRY, May, 1950, page 81, *Levy Slag Processing Plant Crushes, Screens at Rate of 500 T.P.D.*

head, and minus $\frac{9}{16}$-in. material is by-passed to the main conveyor belt to the screen house. Discharge from the secondary crusher is fed by a short stub conveyor to the 30-in. wide Raybestos-Manhattan conveyor moving at 275 f.p.m. to the screen house.

A three-way chute at the top of the screen house takes the discharge of this conveyor and distributes material to three identical Kennedy-Van Saun model AA 4- by 12-ft. vibrating screens having a top deck of $\frac{7}{16}$-in. mesh and a bottom deck of $\frac{1}{8}$- by 2-in. slots. The material retained on the lower deck is the finished coarse lightweight aggregate which is chuted into the proper bin below. Oversize on the top deck is returned to the secondary crusher on a 24-in. Goodrich return conveyor belt moving at 250 f.p.m., while the fines through the lower deck go into the bins as finished fine aggregates.

The collecting bin has two compartments with a total capacity of 300 tons of coarse and fine aggregates. Blending is done by two blending conveyors fed by two Jeffrey 24- by 48-in. vibrating feeders set below the bin. They discharge onto a conveyor belt taking material outside to the waiting trucks. It is planned that one blending belt will be used in a future extension to load railroad cars as well as trucks.

All drives in the operation are interlocked electrically through a control panel of Square-D design so that all affected units are cut off automatically should trouble develop in any unit of the system. All motors are either Westinghouse or Allis-Chalmers. The magnetic pulleys are operated from Westinghouse selenium rectifier power packs which convert the a.c. to d.c. current. Electric current is purchased from the Detroit Edison Company and comes into the plant at 4,800 volts, to be reduced to 440 volts by three 200-kv.-a. single-phase transformers.

The primary purpose of building Dix No. 2 plant was to process high-quality lightweight aggregate which is practically unavailable in the Detroit area. The John A. Mercier Brick Company concrete block plant, located adjacent to the No. 2 plant site, was purchased by the Levy Company three years ago. That company had long had the reputation for making quality concrete products using slag aggregates and the change to lightweight slag aggregates produced at the new Levy plant contributed both a nearby source for materials of high quality and an economy of operation unexcelled in the Detroit area. The abutting areas of the two plants are now efficiently used for storage of lightweight slag of the required gradation and a large stockpile of finished units. A 60-ton-capacity Fairbanks-Morse scale is installed in the Dix No. 2 plant to weigh both incoming and outgoing loads of slag to purchasers and to the Mercier block plant.

Horizontal double-deck vibrating scalping screen with 1½- and 9/16-in. mesh receives all material going to primary crusher.

The three identical 4- by 12-ft. vibrating screens with 7/16-in. top and ⅛- by 2-in. slots in bottom deck. Oversize on top is returned to secondary crusher, material on lower decks is finished coarse lightweight aggregate, and fines are finished fine aggregates.

Primary standard 5-ft. cone crusher receives all material from scalping screen above. Note motor and heavy multiple-V-belt drive at left.

Secondary crusher, a 4-ft. short-head cone crusher, which receives 1½- to 9/16-in. material from scalping screen above primary crusher.

3,000 TONS OF

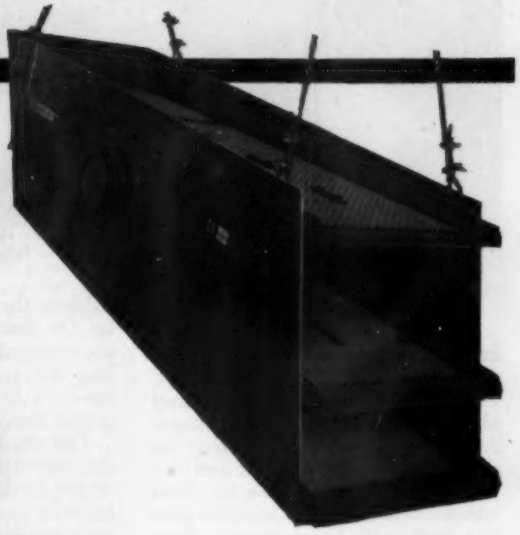
handled by a SIMPLICITY grizzly feeder at Badger Materials in Indiana

On the Indiana Turnpike, Badger Materials Co. is using a Simplicity Grizzly Feeder to handle 3,000 tons of aggregate a day, some of it well over 16 inches in diameter. This same material is being accurately sized by a Simplicity Simpli-Flo two bearing screen. A smooth operation throughout.

Start of the operation is shown here as a seven-yard truck dumps aggregate into a 25-yard receiving hopper. Feeding from this hopper is a Simplicity 3′ x 10′ OA-10-A2 Grizzly Feeder. The stone is fed off the grizzly bars and into a large gyratory crusher. The undersized material passes easily through the bars and onto a belt running under the crusher (the belt also receives crushed stone from the crusher). From here the material is fed into a plant which acts as a secondary crusher.

The material then travels up another belt, goes through a washer, and is discharged . . . onto a Simplicity 4′ x 12″ Simpli-Flo, 3-deck screen. Further washing is accomplished by spray bars on the Simpli-Flo, which is suspended by overhead springs and cables. The various sizes of material are dropped into hoppers and hauled away by trucks. Sand and undersized are sluiced off for separation.

AGGREGATE A DAY



Simplicity Simpli-Flo Screens are two-bearing screens, generally hung by springs and cables from overhead supports. Simpli-Flo screens omit the usual main frame and outboard bearings, thereby offering minimum width for installations where width is a problem. On these double-end drive screens, the eccentric shaft is counter-balanced for efficient true circle operation; bearings are heavy duty eccentric type, protected against dust and water by labyrinth seals; discharge lips are readily accessible; and screen cloth is arranged for easy changing.

The Simplicity Grizzly Feeder combines scalping and feeding in one operation. This unit eliminates the old type arrangement of apron feeder and stationary grizzly. You will gain additional plant room. Your operating and maintenance costs will be cut by 50%. Simplicity Grizzly Feeders use an inertia type drive mechanism, and can produce heavy action, allowing sizes up to 6′ x 20′ and capacities up to 1,000 tons per hour. They maintain positive and controlled feed rates under the bin . . . bridging of material in the hopper is eliminated.

OTHER SIMPLICITY PRODUCTS INCLUDE:

- Os-A-Veyor Feeders
- Simplicity Gyrating Horizontal Screens
- Simplicity 32 Series Balanced Conventional Pan Type Vibrating Conveyors
- Simplicity Woven Wire Screens . . . Send for Catalog No. 66

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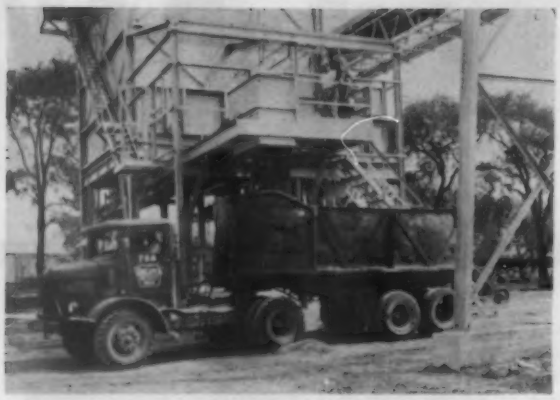


View from ground of truck loading from screen house bins via belt from blending belts. This belt may load railroad cars in future.

Sixty-ton capacity scale in yard of the lightweight plant weighs incoming and outgoing loads of slag aggregates.

Trenton Plant

The McLouth Steel Company's first blast furnace at Trenton, Mich., was blown in September 15, 1954. Prior to the construction of the steel plant, it was necessary to place about 2,000,000 cu. yd. of fill to bring the area to the required grade and improve the condition of the site. This was done by the Levy Company with slag from their Ecorse source. Concurrently with the construction of the steel plant the Levy Company built the slag processing plant of the property adjacent to the McLouth blast furnace pits holding the raw slag.

Two such open pits are used: one contains the hot slag, the other pit can be worked as the slag in the first pit cools. Digging is done with a Northwest 80-D shovel equipped with a 30-ft. boom and a 2½-cu. yd. dipper, loading the slag into two Euclid TD-46 end-dump trucks, which are powered by 300-hp. Cummins diesel engines and which carry 22-ton loads. The slag is dumped directly into a 16-cu. yd. pit hopper or into a surge pile close to the hopper, from which the material is later fed into the hopper with a Caterpillar D8 dozer. Large pieces of iron are removed at this point by a Koehring 401 crane with 55-in. magnet, powered by a G.M. diesel 20 kw. power unit.

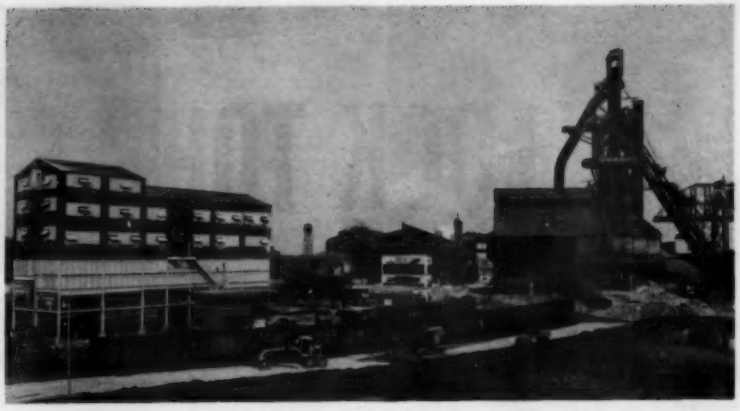
The slag from the hopper is fed to the conveyor by a Jeffrey vibrating feeder having two power units with capacity in excess of 600 t.p.h. The conveyor No. 6 is a 42-in. by 190-ft. Robins inclined belt conveyor, moving at 175 f.p.m. to the 48-in. diameter by 42-in. wide Stearns magnetic head pulley at the top of the crusher house. This belt discharges to a 5- by 10-ft. Kennedy-Van Saun type AAA double-deck scalper screen operating at 900 r.p.m. Material off the top deck goes to a 5½-ft. Symons standard cone crusher, while the slag off the bottom deck is chuted to a 4-ft. Symons short head cone crusher. Material through the bottom deck by-passes the crusher to fall directly on 36-in. by 295-ft. conveyor No. 4, moving at 300 f.p.m. Materials from the primary crusher also falls directly on this belt. The product of the secondary short head crusher is transferred by 24-in. by 15-ft. stub conveyor belt No. 5 to the No. 4 conveyor.

This conveyor goes up over a 48- by 36-in. wide Stearns magnetic pulley. To save space the conveyor completes its rise within the screen house, discharging to a 4- by 14-ft. Kennedy-Van Saun type AAA double-deck finishing screen, No. 4, having 2½-in. square openings in the top deck and 1½-in. square openings in the bottom deck. Material off these two decks go into respective bins set beneath, while the minus 1½-in. material goes to conveyor No. 3, 24- by 36-in., moving at 300 f.p.m., which carries the material to screen No. 3. This screen has 1⅛-in. top openings and ¾-in. bottom deck openings.

Material off these two decks goes into the proper bins, while the minus ¾-in. slag goes to another screen, No. 2, which has $\frac{9}{16}$-in. top openings and ⅜-in. bottom openings. Again, the materials off these two decks go into the bins below, and the minus ⅜-in. slag is carried by 24-in. by 20-ft. conveyor No. 1 to screen No. 1, having a .207-in top screen and a bottom deck with ⅛-in. by $\frac{3}{16}$-in. slots. Material off both decks goes into bins and the minus ⅛-in. slag goes to a bin containing the fine (sand) size aggregate.

All of the bins are unloaded by Jeffrey-Traylor 39- by 42-in. wide vibrating feeders, each having a capacity of 150 t.p.h. These feed onto a 42-in. by 120-ft. blending belt conveyor, No. 7. All feeders are controlled by the loader man from a central control panel, the rate of feed of each being adjusted very accurately by rheostat control units. All motors in the plant are Westing-

New lightweight slag processing plant of the Edw. C. Levy Company, Detroit, Mich. Crusher house is at left and screen house at right. All belts are covered and have walkways.



Slag processing plant (left) and blast furnace at McLouth Steel Company, Trenton, Mich.

house. Power is received at 6,900 volts and transformed to 440-volt current by means of three 250 kv.-a. single-phase transformers.

The scope of motors used in the plant includes a 200-hp. motor on the primary crusher, a 150-hp. motor for the short head secondary crusher, a 75-hp. motor on the No. 4 conveyor, a 50-hp. motor on conveyor No. 6, and a 20-hp. motor on the blending belt, No. 7. Conveyors No. 1, 2, 3, and 5 are powered by 7½-hp. motors.

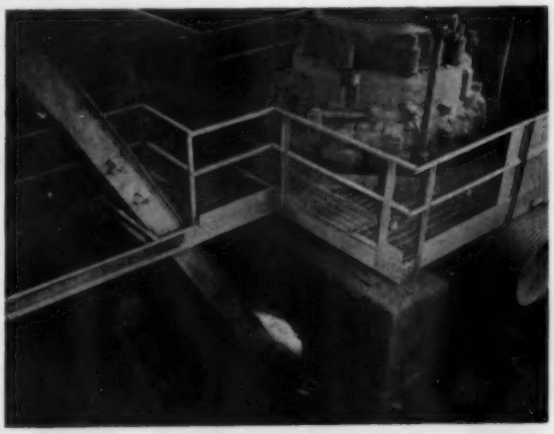
History

Edw. C. Levy, the founder of the Levy Company, was born on a farm near Big Beaver, Mich., 30 miles north of Detroit. He has handled slag since 1923, when he first met Henry Ford, who was then operating his own crushing and screening plant on the blast-furnace slag accumulations. Upon the completion of additional furnaces in 1948, it was apparent to the Ford Motor Co. that its facilities were inadequate for handling the volume of slag then being produced, and Ford made a contract with Mr. Levy which resulted in the construction of the Dix No. 1 plant.

Mr. Levy has over the last 30 years shown an uncanny ability to foresee useful developments in the slag industry, and to act on these in creating industrial wealth for many outside his own large organization. He is constantly concerned with finding new uses for slag. At present a market has been developed for the product to the point where the company supplies aggregates for a major portion of the paving work done in the Detroit area, as well as most of the bituminous concrete, roofing slag, railroad ballast,and parking lot construction requirements. With the new lightweight aggregate plant, the company will be able to supply large quantities of slag to concrete block producers.

Since 1935 Levy has handled slag from the Great Lakes Steel Company plant at Ecorse, Mich., one of the contracts with that company having involved hauling over 4,000,000 cu. yd. of slag fill into the 200-acre swamp on which the plant was built. Great Lakes at first processed its own slag, but with the addition of blast furnaces to the number of four, this processing was discontinued and Levy now handles all of the company's output of raw slag.

In all its varied operations the Levy Company use more than 275 trucks, 200 trailers, 40 dragline cranes, 22 bulldozers, and 4 motor patrol graders, the last for constructing the many parking lots being built in this center of automobile production. In processing or otherwise handling the volume of some 2,000,000 tons of slag, and an additional 1,000,000 tons of ore, coal, and limestone yearly, the



Standard cone (right) and short head crushers (left) in the crusher house.

Below, left: One of the double-deck vibrating screens in the screen house at the Trenton plant.

Below, right: A line of vibrating feeders unloading the different materials from the bins to the blending belt conveyor. Rate of feed for each is adjusted by rheostat control units.

LOOK TO GarWood -St.Paul-

HYDRAULIC HOISTS AND MATCHING BODIES by Gar Wood-St. Paul have lower net cost per payload hour. They're preferred by more truck owners for smooth, trouble-free operation.

FOR LEADERSHIP in Truck Equipment

GAR WOOD LOAD-PACKERS, the original packing-type refuse collection units, provide greater sanitation at lower cost for both community and industry.

Consolidation of America's pioneer hydraulic hoist companies offers advantages in engineering, sales and service for truck equipment users

Now there's *one* name to remember for the most advanced line of truck equipment on the market! It's Gar Wood-St. Paul, a name made possible by the recent consolidation of these two pioneer hydraulic hoist companies.

This is the most important news for truck equipment users since the invention of the hydraulic hoist! It brings these major advantages to you:

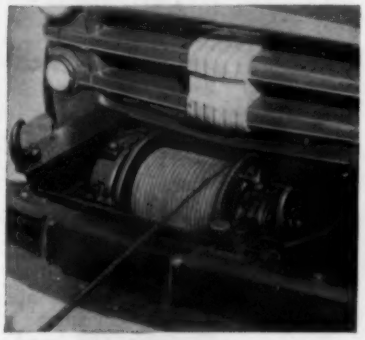
Engineering know-how and manufacturing skill — Gar Wood invented the hydraulic hoist . . . St. Paul developed it. Now both organizations are combined for new advances in truck equipment design.

One world-wide sales and service organization of leading truck equipment distributors . . . experienced in application, qualified to analyze your equipment requirements and recommend the most efficient unit to fit them. This organization will also offer prompt service on any Gar Wood or St. Paul equipment you may already own.

New savings in shipping costs—With three modern plants producing the Gar Wood-St. Paul line, your distributor can select the base point most economical for you.

Find out now about the consolidated line of Gar Wood-St. Paul truck equipment . . . hydraulic hoists and bodies, Frate-Gates, truck cranes and winches, and sanitary refuse collection units. For the name of your nearest Gar Wood-St. Paul distributor, write now to: Customer Service Department, Gar Wood Industries, Inc., Wayne, Michigan.

GAR WOOD-ST. PAUL FRATE-GATES, with power closing, cut delivery costs . . . speed loading and unloading . . . reduce damage claims.



GAR WOOD WINCHES feature exclusive aluminum housings for faster heat dissipation, less dead weight. They're also components of Gar Wood Truck-Mounted Cranes.

GAR WOOD INDUSTRIES, INC.

Wayne, Michigan • Richmond, California

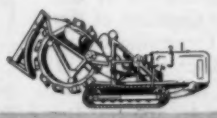
Plants in Wayne and Ypsilanti, Mich.; Findlay, Ohio; Mattoon, Ill.; Richmond, Calif.

Gar Wood Truck Cranes

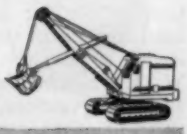
Gar Wood-St. Paul PTO Units

Gar Wood-Buckeye Spreaders

Gar Wood-Buckeye Finegraders



Gar Wood-Buckeye Ditchers



Gar Wood Excavators

A truck loading lightweight slag aggregate at the discharge end of the conveyor from the final screening building. This conveyor will be extended at this point to load railroad cars.

equipment burns up over 1,300,000 gallons of gasoline plus another 300,000gallons of diesel fuel each year.

On a peak day—of which there are many—about 800 persons are employed in all the operations. Seventy persons are required to maintain the equipment fleet alone, this department operating on a 24-hour basis in handling all repairs—even in building the batteries used in the trucks. The company designs and builds a great portion of its plant equipment. Within the last few years two-way radio communications sets (Motorola) have been installed in about 15 mobile units, including supervisory and salesmen's cars, mobile service units, gasoline wagons, etc.

In the operation of the three processing plants the efficiency of output per employee is especially emphasized. Full capacity can be obtained, for instance, in Dix No. 2 plant by the work of but four men—one man to feed the plant, one to load material out, a sweeper, and a foreman. When this plant is not operating, these personnel join the maintenance crew. Similarly, the large Dix No. 1 plant uses but 23 men in direct operations, and the new Trenton plant will operate at capacity with only 10 direct employees.

Edward C. Levy is president of the Levy Company; his nephew, M. E. Harris, executive vice-president; Edward C. Levy Jr. is vice-president in charge of production and engineering; G. L. Green is secretary; and Karl Koropp is plant engineer for all plants.

American Aggregates

(*From page* 132)

being discharged to appropriate bins through the swiveled discharge chute. Loading gates below the bins supply trucks on either or both of two lanes.

Twin City Iron and Wire Company screen cloth is used on all sizing units, while Republic Record Maker belts and Dorris conveyor drives are employed on most conveying units. The Bucyrus-Erie 50B diesel dragline that opened the dredge cut is used in removing overburden ahead of the dredging area, and for general utility. A ¾-cu. yd. Lima Paymaster, powered by a Caterpillar diesel, is employed in loading portable bins and stockpiling. Two 1½-cu. yd. Hough Payloaders are also used in direct ground loading.

Engineering, erection, and installation of fixed facilities were accomplished almost entirely within the American Aggregates family. The Greenville (Ohio) Manufacturing Works fabricated 1,154,739 lb. of structural steel—virtually the entire plant structure—in addition to bins and conveyors. The electrical department designed and fabricated all the panels and controls for the 54 electric motors which were installed. Construction was carried out by the local crew under the direction of the engineers from the Greenville office, W. I. Thieme, district manager of Indiana operations, and N. R. Garrison, plant manager for the two Indianapolis operations.

A relatively small crew of 12 men, who handle everything from dredging to loading, is divided between the night shift on the dredge and the day shift of the processing plant.

Despite the newness of the operation, the overall company policy and attitude concerning land rehabilitation and reclamation has already been brought into play at this location. During construction, it was necessary to place 15 ft. of fill along a road on the property line. When this had been done, the local crew set in a long row of honeysuckles to improve the appearance. With this grade established on the boundary, a large part of eventual total reclamation is being realized currently through the operating procedure of fluming plant fines to fill in depleted areas of the dredging lake. Thus, final restoration of the surface will require only nominal effort.

Lewis R. Sanderson, president of the National Gypsum Company, recently launched a new ship in Germany which was built for his concern. The boat was named for him. This vessel and two others under construction will be used to carry gypsum rock from the firm's Nova Scotia mines to Atlantic seaboard plants.

At the Bonner Springs, Kans., plant of the Lone Star Cement Corporation the fourth kiln to be installed here, a 326-ft. unit recently went into production.

Lone Star Awards Contracts For Plant at Lake Charles

Frank Miller and Sons, Inc., of Lake Charles, La., and the Walsh Construction Company, of New York, have been awarded contracts for the erection of the Lone Star Cement Corporation's new plant in Lake Charles, La.

Officials say that the plant will be "one of the most modern in the world". It will have an initial capacity of 2,000,000 bbl. annually and will be designed to double its capacity when the demand increases.

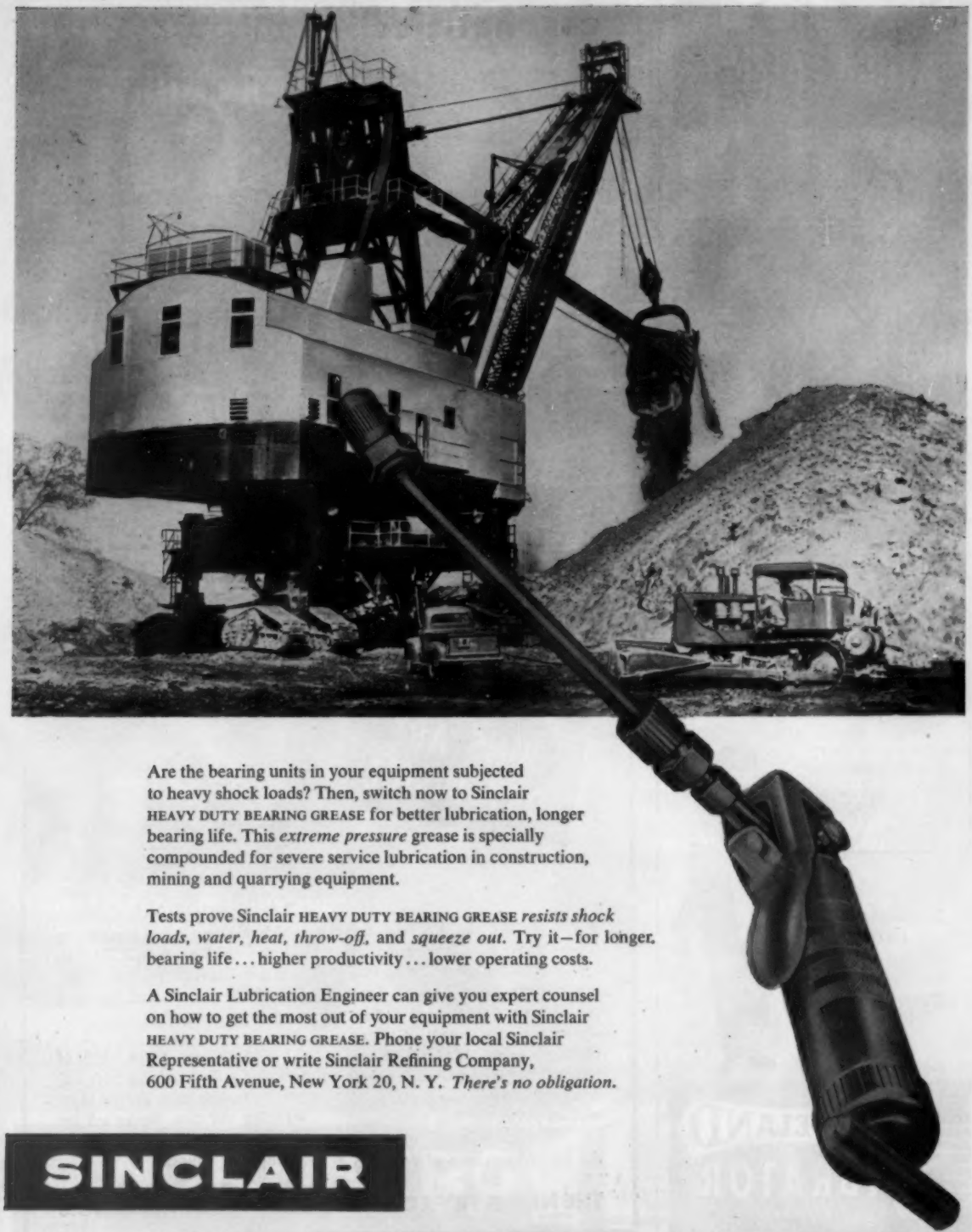
D. W. Miller New Sales Mgr. Of Celotex Gypsum Products

Donald W. Miller has been promoted to the post of manager of gypsum sales for the Celotex Corporation, according to an announcement released by Marvin Greenwood, vice-president and general sales manager.

Mr. Miller has been associated with the firm since 1948, and has had 20 years of experience in the building industry. In his new position he will direct the sales of the company's Celo-Rok brand of gypsum products.

Sampson's Sand and Gravel Company, situated near Moses Lake, Wash., was recently put into operation, according to the owners, John and Harlan Sampson. The pit and screening plant will produce concrete and mortar sands and gravel.

Resists Shock!



Are the bearing units in your equipment subjected to heavy shock loads? Then, switch now to Sinclair HEAVY DUTY BEARING GREASE for better lubrication, longer bearing life. This *extreme pressure* grease is specially compounded for severe service lubrication in construction, mining and quarrying equipment.

Tests prove Sinclair HEAVY DUTY BEARING GREASE *resists shock loads, water, heat, throw-off,* and *squeeze out.* Try it—for longer bearing life... higher productivity... lower operating costs.

A Sinclair Lubrication Engineer can give you expert counsel on how to get the most out of your equipment with Sinclair HEAVY DUTY BEARING GREASE. Phone your local Sinclair Representative or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y. *There's no obligation.*

SINCLAIR

HEAVY DUTY BEARING GREASE

BIN STUCK LATELY?

There's a better way to loosen up those bins . . . with a CLEVELAND AIR OR ELECTRIC VIBRATOR. It'll save on your shoe leather, your handling devices and your production time. Processors everywhere are using them to keep their materials moving swiftly and smoothly. There's a size and type for every requirement.

Free engineering service.

Write for our new literature.

THE CLEVELAND VIBRATOR COMPANY

2710 Clinton Ave. • Cleveland 13, Ohio

Industry Personalities

Superior Portland Cement, Inc., has announced the appointment of BENNETT M. SAUNDERS to the sales staff of the company.

THOMAS L. RALPH has been elected to the board of directors of the Whitehall Cement Manufacturing Company in Philadelphia. Mr. Ralph is vice-president of the Fidelity-Philadelphia Trust Company.

KEFTON H. TEAGUE, formerly a geologist with the United States Geological Survey and the Tennessee Valley Authority, has joined the Industrial Minerals Division of International Minerals and Chemical Corporation, according to Norman J. Dunbeck Jr., vice-president in charge of the firm's Industrial Minerals Division.

A geological engineering graduate from North Carolina State College, Mr. Teague will join the geological staff of International under the supervision of Frank R. Hunter, division geologist.

MILTON MATHEWS, vice-president in charge of sales of the Marblehead Lime Company, was recently honored on the occasion of his 50th anniversary with the company.

F. L. Crosby

FRANK L. CROSBY, Seattle, Wash., has been appointed director of public relations for Kaiser Gypsum Company, according to CLAUDE E. HARPER, vice-president and general manager. Mr. Crosby had been handling the company's public relations in the Northwest area for 18 months and prior to that time was public relations director for the Columbia Lumber Company, of Alaska, and the Alaska Plywood Corporation, in Juneau. He will make his headquarters in Oakland.

NEFF & FRY BINS ARE DRY INSIDE

When we erected 17 bins for Johns-Mansville Corporation at Fort Worth, one specification was that the bins must show no signs of leakage or dampness after testing with direct impact of water through a standard fire hose nozzle. The bins are used for handling and storing slate granules of various colors for roof coverings.

"The photograph indicates the water resistance of your bin which was tested in a most rigorous manner," wrote L. A. Benton, Johns-Mansville Project Engineer. "The installation has been very satisfactory."

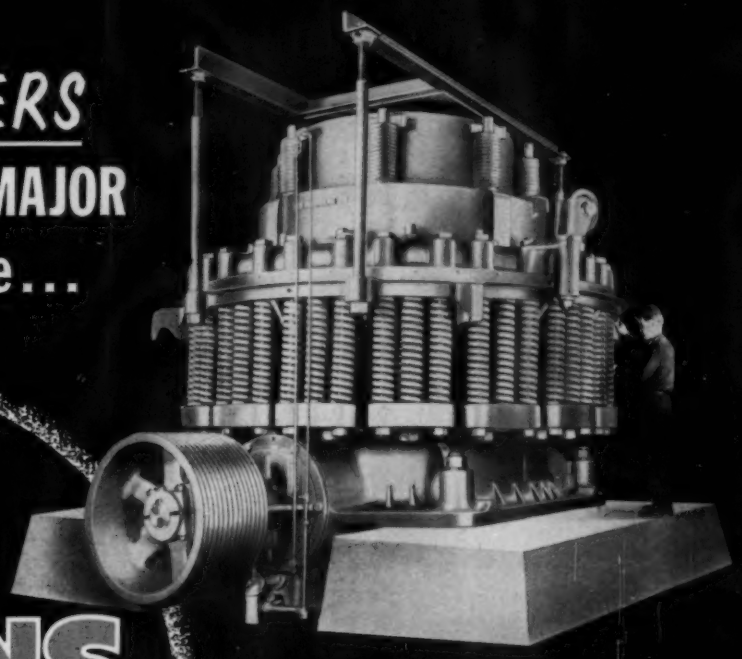
No matter what kind of flowable bulk materials you use, you'll exercise good judgment by selecting our bins. Better ask for our folder, "Bins With the Strength of Pillars."

THE NEFF & FRY CO. • 278 Elm St. • Camden, Ohio

SUPER-CONCRETE STAVE STORAGE BINS

REPEAT ORDERS

from the WORLD'S MAJOR PRODUCERS prove...



There is no substitute for SYMONS® CONE CRUSHERS

Proved in the profitable reduction of these and many more ores and minerals . . .

- ASBESTOS
- ABRASIVES
- CEMENT
- CHROMIUM
- COPPER
- FELDSPAR
- GOLD
- GRAVEL
- IRON ORE
- LEAD
- LIMESTONE
- MANGANESE
- MOLYBDENUM
- NICKEL
- SILVER
- SLAG
- STONE
- TACONITE
- TITANIUM
- TIN
- TUNGSTEN
- URANIUM
- VANADIUM
- ZINC

. . . here are a few good reasons:

- ✓ LOWEST COST PER TON OF CRUSHED PRODUCT
- ✓ UNIFORM CONTROLLED FEED
- ✓ MAXIMUM LINER UTILIZATION
- ✓ GREAT CAPACITY OF FINELY AND UNIFORMLY CRUSHED PRODUCT
- ✓ LOW COST—TROUBLE-FREE OPERATION

Symons Cone Crushers, *the machines that revolutionized crushing practice,* are built in Standard, Short Head and Intermediate types, with crushing heads from 22 inches to 7 feet in diameter—in capacities from 6 to 900 tons per hour.

SYMONS . . . A REGISTERED NORDBERG TRADEMARK KNOWN THROUGHOUT THE WORLD

NORDBERG MFG. CO., Milwaukee, Wisconsin

NORDBERG

MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

NEW YORK • SAN FRANCISCO • DULUTH • WASHINGTON
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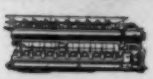
SYMONS PRIMARY GYRATORY CRUSHERS

GRINDING MILLS

MINE HOISTS

SYMONS VIBRATING GRIZZLIES and SCREENS



DIESEL ENGINES

C355

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Marcy Center Peripheral Discharge Rod Mill for grinding specification sands.

MARCY...1st in EXPERIENCE

on efficient, low cost sand grinding

HOW RESEARCH AND EXPERIENCE CUT SAND GRINDING COSTS

Extensive research and experimentation, since 1915, with various metals resulted in the selection of Meehanite metal for mill heads, spur gears and bearings. Meehanite, due to its controlled structure, uniformly disseminated carbon content, and casting characteristics has the following advantages...

- a dampening characteristic which minimizes the effect of vibration.
- provides high fatigue resistance under alternating stresses created in grinding mills.
- high damping capacity for vibration prevents buildup of resonant stresses in gears, assuring quiet, smooth operation.
- high strength properties with low coefficient of expansion, excellent resistance to wear, and resistance to surface breakdown, assure long wearing life.
- its strength and toughness eliminate danger of cracks in mill heads.

THE OUTSTANDING SERVICE PERFORMANCE OF MEEHANITE, SINCE 1937, HAS PROVED ITS ABILITY TO GIVE LONG, TROUBLE-FREE SERVICE... AND IS ONE OF MANY IMPORTANT MARCY FEATURES WHICH REDUCE GRINDING COSTS.

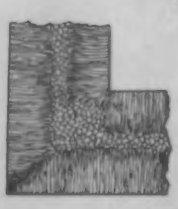
In the manufacture of any metal casting, uniform solidity and closeness of grain throughout all sections are basic essentials of dependable castings.

STEEL... marked liquid contraction causes shrink voids, porosity and cracks.

CAST IRON... slight liquid expansion causes porosity and voids.

MEEHANITE METAL... provides uniform solidity; permits designing and pouring castings that will have the desired strength and functional properties, free from casting strains.

All metals tend to form columnar crystallations on changing from liquid to solid state and the junction of columnar crystals is a common cause of structural weakness in steel and other alloys.



STEEL... the junction of columnar crystals causes weakness in steel.

MEEHANITE... castings are substantially free from planes of internal weakness, shrinks, and columnar crystal embrittlement.

The Mine & Smelter Supply Co.

Denver • Salt Lake City • El Paso • New York

Representatives in Foreign Countries

write for new MARCY MILL CATALOG

SPECIALISTS IN GRINDING FOR FORTY YEARS

Following the purchase of the Niles Fire Brick Company, Mexico Refractories Company, Mexico, Mo., has announced the promotion of E. C. TINSLEY to the position of vice-president in charge of refractory specialties. HALFRED F. RANDOLPH, formerly assistant manager, is now manager of the Refractory Specialties Division of the company.

E. C. Tinsley

H. F. Randolph

Mr. Tinsley has been associated with the Mex-R-Co. organization since 1935. Mr. Randolph joined the firm at its Mexico plant in 1941, became special assistant to the manager of the Specialties Division three months later, and served in this position, with the interruption of a four-year-period of service in the Army from 1942 to 1946, until his promotion in 1953 to assistant manager.

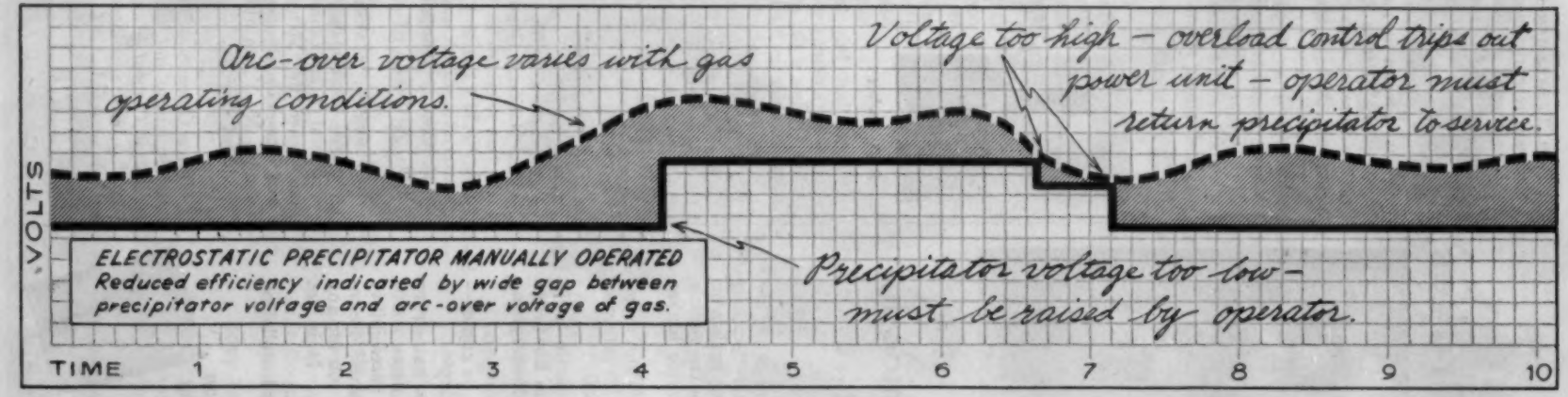
R. R. MCBRIDE has been appointed project manager for the construction of the Lake Charles, La., plant of the Lone Star Cement Corporation.

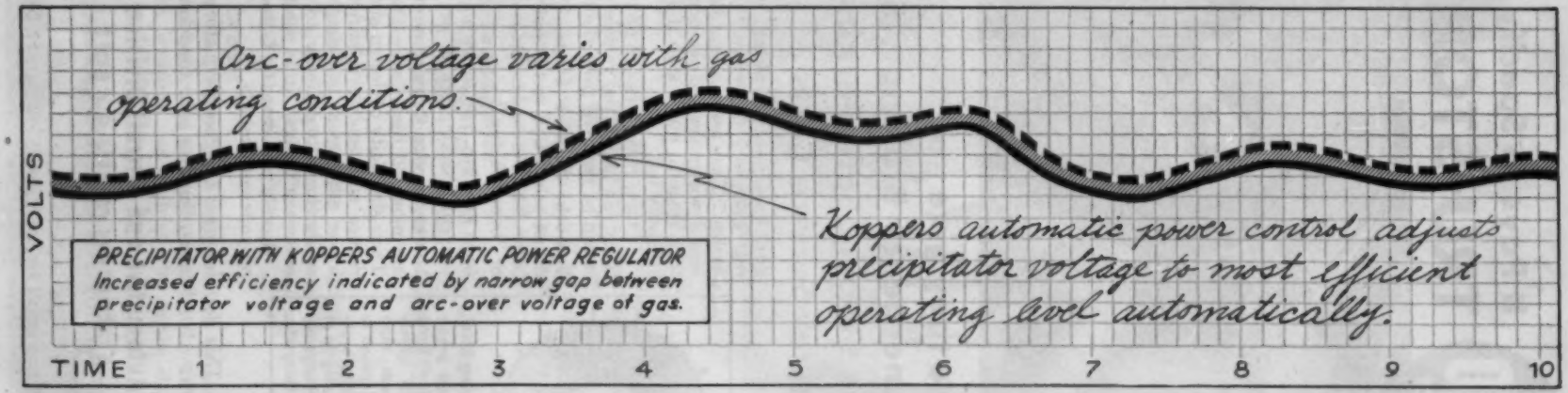
LEE H. CLARK, general manager of the Pennsylvania Salt Manufacturing Company's Sharples Chemicals Division, has been named vice-president of the parent company, President William P. Drake has announced. While the scope of Mr. Clark's new office was not disclosed, it is understood that his major duties will be concerned with corporate organization and planning functions.

Mr. Clark was educated at Cornell University, where he majored in chemical engineering. After brief associations with the National Sugar Refining and General Chemical companies, he joined the Sharples Corporation as a chemist in 1921. Two years later he became chief chemist. He served the corporation in various capacities until it became a Pennsalt division.

JAMES J. MYERS has succeeded JOHN C. CALHOUN, resigned, as Milwaukee, Wis., district sales manager of the National Gypsum Company. Mr. Myers has been assistant manager in Cincinnati since 1949.

EFFICIENCY GRAPHS: Comparative graphs show the relative difference between MANUAL and AUTOMATIC power operation for electrostatic precipitators


Arc-over voltage varies with gas operating conditions.
Voltage too high – overload control trips out power unit – operator must return precipitator to service.
VOLTS
ELECTROSTATIC PRECIPITATOR MANUALLY OPERATED
Reduced efficiency indicated by wide gap between precipitator voltage and arc-over voltage of gas.
Precipitator voltage too low – must be raised by operator.
TIME 1 2 3 4 5 6 7 8 9 10


Arc-over voltage varies with gas operating conditions.
VOLTS
PRECIPITATOR WITH KOPPERS AUTOMATIC POWER REGULATOR
Increased efficiency indicated by narrow gap between precipitator voltage and arc-over voltage of gas.
Koppers automatic power control adjusts precipitator voltage to most efficient operating level automatically.
TIME 1 2 3 4 5 6 7 8 9 10

SEND FOR FREE BULLETIN

Free bulletin shows in detail how this compact cabinet unit reduces wasteful "sparkover" and enables Koppers Precipitators to operate continually at peak efficiency voltage without frequent "trip-outs." See how this new Koppers Automatic Power Regulator eliminates need for constant personal attention. For bulletin M40 . . . or if you desire an analysis, or recommendation for your operation . . . write to Koppers Company, Inc., *Industrial Gas Cleaning Dept.*, 231 Scott St., Baltimore 3, Md.

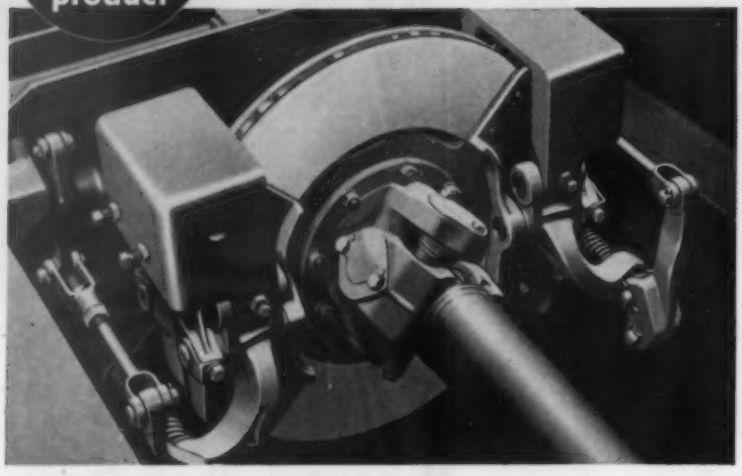
KOPPERS®

ELECTROSTATIC PRECIPITATORS

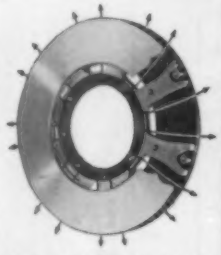
METAL PRODUCTS DIVISION • KOPPERS COMPANY, INC. • BALTIMORE 3, MD. This Koppers Division also supplies industry with Fast's Couplings, American Hammered Industrial Piston and Sealing Rings, Aeromaster Fans, Gas Apparatus. *Engineered* **Products Sold with** *Service.*

an ACCO product

It Pays to Specify TRU-STOP Brakes



because they give you Real Emergency Braking...Smooth, Positive Stops...Safe Parking... and Lower Service Costs



Longer Lining Life

• The terrific heat generated in braking cuts lining life. TRU-STOPS quickly dissipate this heat. Most of the disc is exposed to the air even during braking. And a cooling jet of air circulates through the disc, prolongs lining life.

Real Emergency Braking. TRU-STOPS *are real emergency brakes—not just "parking brakes."* They serve as auxiliary brakes on long down-grades and can bring the vehicle to a smooth, quick stop if service brakes suddenly fail.

In fact, TRU-STOPS can do this and more. They can handle the vehicle with safety so it can be removed from the road.

Smooth, Positive Stops. Pressure is in direct proportion to the pull on the brake lever. There is no dangerous self-energizing or "over-braking."

Safe Parking. TRU-STOPS hold on grades—prevent "parking brake" accidents.

Lower Service Requirements. TRU-STOPS are mounted directly on the drive shaft. Their simplicity of design and accessibility reduce maintenance requirements. Relining or adjustment is a simple job for any mechanic with ordinary tools. It is not necessary to drop drive shaft.

Specify TRU-STOPS for factory installation on your next vehicle.

This Booklet gives the complete story on TRU-STOP Brakes. Send for your copy today

ACCO

Automotive and Aircraft Division

AMERICAN CHAIN & CABLE

601 Stephenson Bldg., Detroit 2

2216 South Garfield Ave., Los Angeles 22 • Bridgeport 2, Conn.

PAUL T. ALLSMAN of Kensington, Md., was recently named chief mining engineer of the Bureau of Mines by approval of Secretary of the Interior Douglas McKay.

A member of the Bureau since 1936, Mr. Allsman has been assistant regional director for metals and minerals of the 27-state Eastern Region of the Bureau, with offices at College Park, Md. In his new position he succeeds EUGENE D. GARDNER, who retired as the Bureau's chief mining engineer earlier this year. Mr. Allsman will be staff adviser to all units of the Bureau in various fields of mining research and related activities.

C. D. Harless

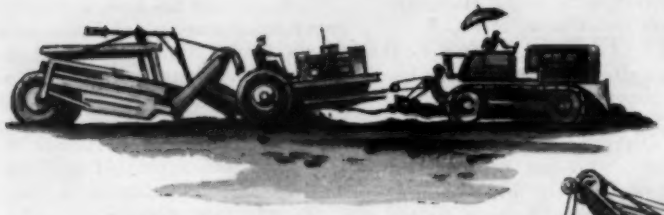
CHARLES D. HARLESS has been named Eastern Division sales manager of the National Gypsum Co., according to John W. Brown, vice-president of sales. He succeeds MELVIN F. CERRUTI, who was promoted last July to the post of general sales manager.

Mr. Harless is the youngest senior sales executive in National Gypsum. His promotion was effective January 1. The Eastern Division of National Gypsum embraces the New York City metropolitan area, New England, and the Albany, N. Y., and Philadelphia areas. Mr. Harless will have his headquarters in New York City.

The new division manager has served as New York City district manager since July 1, 1953. He joined National Gypsum as a general line salesman in the Albuquerque, N. M., territory in 1945 and advanced until he was sent to New York City as assistant manager in 1951.

GEORGE E. ELSENHANS, former technical service engineer for the Universal Atlas Cement Company, has joined the Metropolitan Sand and Gravel Corporation, Port Washington, N. Y., in the capacity of technical director.

THOR GERMUNDSSON, manager of the Structural and Railways Bureau, Portland Cement Association, Chicago, has been appointed chairman of the Joint A.C.I.-A.S.C.E. Committee 323, Prestressed Reinforced Concrete. Mr. Germundsson succeeds the late A. E. Cummings.

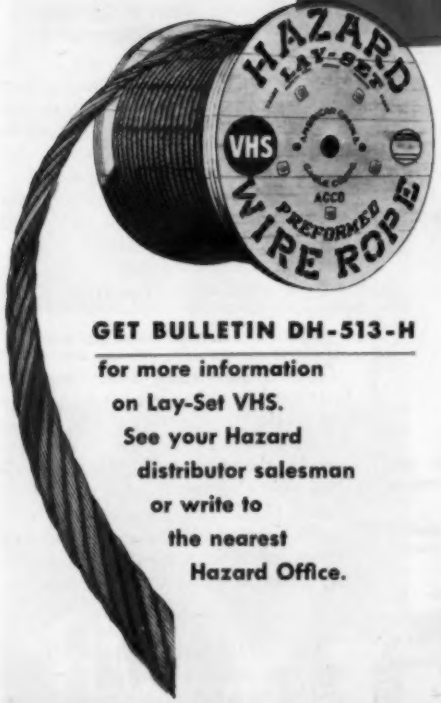


Users are enthusiastic over Lay-Set VHS . . . The New Wire Rope that's 15% Stronger, Tougher for Shovel Hoist Ropes, Drag Lines and Scraper Cables.

And Here's More Good News . . .

IT'S NOW IN STOCK!

LAY-SET VHS ...15% STRONGER



GET BULLETIN DH-513-H

for more information on Lay-Set VHS. See your Hazard distributor salesman or write to the nearest Hazard Office.

Heavier Loads—With Greater Safety

Your Hazard distributor now has LAY-SET VHS . . . a new wire rope at least 15% stronger than Improved Plow Steel, which has been the strongest grade available up to now. This new, stronger wire rope was developed especially for use as shovel hoist ropes, scraper cables and drag lines.

With stronger LAY-SET VHS you will be able to handle heavier loads with the same diameter line. And because of its greater strength, you get a higher factor of safety.

Tougher, Lasts Longer

New VHS is not only stronger, it's also tougher. It resists abrasion . . . keeps its shape under pressure . . . can't become "hide bound" or lose its flexibility. And it has all the advantages of Preformed construction.

Costs Less To Use

Stronger, tougher LAY-SET VHS lasts longer under the punishment which shovel hoist ropes, drag lines and scraper cables get. It drastically cuts "down time" of equipment for wire rope replacement. This saves you money!

Easy To Order

You don't need complicated specifications to order LAY-SET VHS. Just ask your Hazard distributor for LAY-SET VHS shovel hoist ropes, scraper ropes or drag lines in the size you want. Call him today.

HAZARD WIRE ROPE DIVISION
American Chain & Cable Company, Inc.

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Bridgeport, Conn.

JOHN R. LYNCH has been appointed sales manager for the Pittsburgh district of the National Gypsum Company, succeeding William M. Ritchey. Mr. Ritchey was named northwestern Pennsylvania sales representative. Mr. Lynch joined National Gypsum in 1947.

JAMES L. MEADOW, former newspaperman and construction editor, has joined the public relations staff of the Portland Cement Association in Chicago. Mr. Meadows formerly edited *Construction News Monthly*, a regional publication in Little Rock, Ark. He will work in the Highways and Municipal Bureau of P.C.A.

HARRIS ROBERTS has been appointed superintendent of the Alsen, N. Y., plant of the North American Cement Company. He succeeds HILTON LONG, who has been named superintendent of the firm's plant at Howe's Cave. Mr. Roberts started with the firm as a clerk 18 years ago. He served as yard foreman, shift foreman, master mechanic, general maintenance foreman, and assistant superintendent, the position he held previous to his recent advancement.

V. R. BELDEN has been appointed merchandise manager of dealer sales for the United States Gypsum Company with headquarters in Chicago. He succeeds GEORGE V. LANE, who was named regional manager for the concern in California. HAROLD W. DAVIS has been appointed merchandise manager of industrial gypsum, lime, and paper products.

Four members of the Kaiser Gypsum Company's sales department have been appointed to new positions, according to an announcement made by Colin L. Campbell, general sales manager.

DONALD G. WOODFORD, a former line salesman, has been named assistant general sales manager; JAMES W. HUM and HARRY KIMBELL were appointed sales representatives in Southern California, and CLARK GALLOWAY a sales representative in northern California.

At the annual election of the Building Congress & Exchange of Baltimore, ROBERT F. PORTER, vice-president of the Harry T. Campbell Sons' Corporation, Towson, Md., was elected president. Mr. Porter is a former president of the National Ready Mixed Concrete Association.

TIME FOR BETTER WEIGHING MACHINES

MERRICK SCALES 1956

MERRICK Feedoweights* feeding clinker in finish mill of large cement plant.

This year . . . every year . . . MERRICK Weightometers and Feedoweights are "key instruments" of production throughout the bulk material handling and processing industries.

Careful and experienced engineering together with quality workmanship assure accurate and economical weight records. Ease of installation and minimum maintenance guarantee high uniformity of finished product.

MERRICK Weightometers* provide continuous and precise weight records of material in transit on existing conveyors and are applicable to any width belt.

MERRICK Feedoweights* automatically blend, feed and proportion by weight such materials as clinker, gypsum, stone, ore and coal . . . infinitely over a wide range.

Write for Bulletins 375 and 253 **Reg. U. S. Pat. Office*

MERRICK SCALE MFG. CO.
180 AUTUMN STREET • PASSAIC, NEW JERSEY

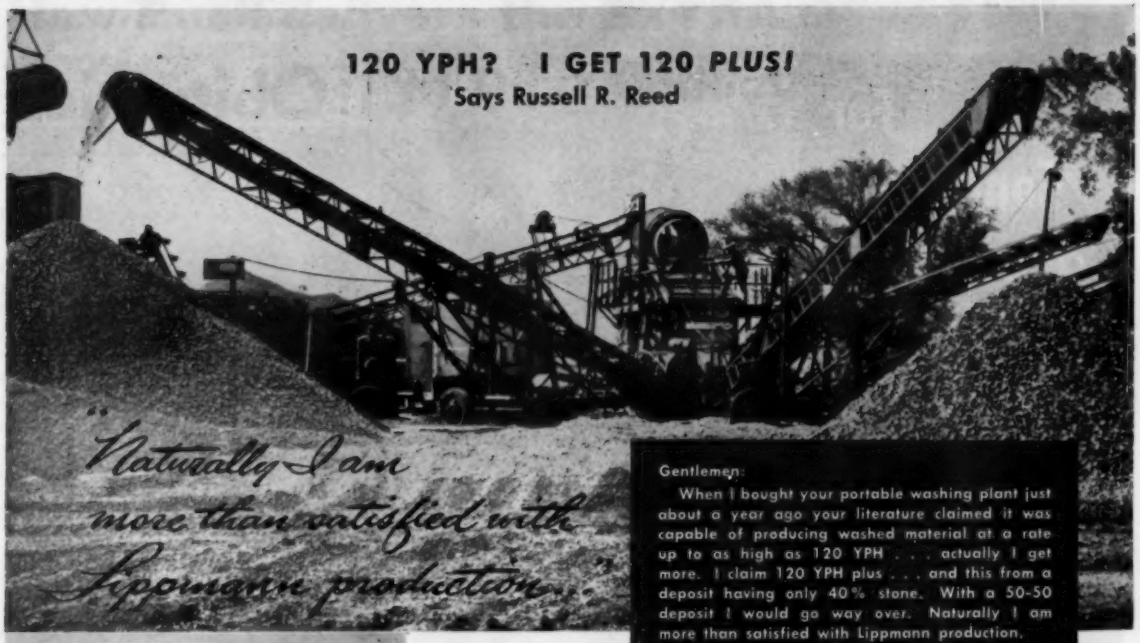
Hays County Gravel Company Buys Green Valley Gravel Co.

McBride Wilson, manager of the Hays County Gravel Company, San Marcos, Tex., has announced the company's purchase of the equipment and sand and gravel deposits of the Green Valley Gravel Company.

Merger plans of the two companies call for the processing of sand and gravel to continue at Green Valley, but the manufacturing of concrete will be handled by the Hays Company.

Trucks patterned after the old-fashioned trackless street cars are being made by the Kenworth Motor Truck Company, Seattle, Wash., for use in the limestone mine of the Riverside Cement Company at Riverside, Calif. The trucks will receive power from overhead wires, but will be equipped with a cable reel enabling them to leave the wire zone.

A $7,000,000 contract for the design and construction of the Marquette Cement Manufacturing Company's new plant in Cape Girardeau, Mo., has been awarded to the Kaiser Engineers Division of the Henry J. Kaiser Company.



Gentlemen:

When I bought your portable washing plant just about a year ago your literature claimed it was capable of producing washed material at a rate up to as high as 120 YPH . . . actually I get more. I claim 120 YPH plus . . . and this from a deposit having only 40% stone. With a 50-50 deposit I would go way over. Naturally I am more than satisfied with Lippmann production.

(Signed) Russell R. Reed

Lippmann Super-Capacity plant — a champion with a champion's look.

Above and below are views of other Lippmann portable washing plant layouts in operation in Northern Illinois and Southern Wisconsin.

LIPPMANN Portable Washing Plants Will Do More For You

Like Mr. Reed, sand and gravel operator at Woodstock, Ill., you will find that Lippmann Portable Washing Plants give you more capacity and real drive-it-to-the-job profits. There's a choice of two models to meet your needs—the WASH-MORE with capacity up to 80 yards per hour and the SUPER-CAPACITY — the only washer with enough capacity (120 cu. yd. per hour to keep up with a double drum paver.

These rugged plants are built to give *you* long service. Heavy frames need no blocking. Larger components perfectly co-ordinated with each other produce three sizes of gravel and one of sand. Both models use a 3-deck eccentric vibrating screen — far superior to revolving screens used on conventional units. The Sand Drag has a larger settling pool to recover more sand and deliver dryer sand. All of which adds up to one thing — greater opportunities for lower bids at more profits.

Why not look into the possibilities of one of these plants for your operations — like Mr. Reed, learn how Lippmann engineering pays off with higher capacity, cleaner product, accurate sizing, greater sand recovery and reduced maintenance. Lippmann Engineering Works, 4607 W. Mitchell Street, Milwaukee 14, Wis.

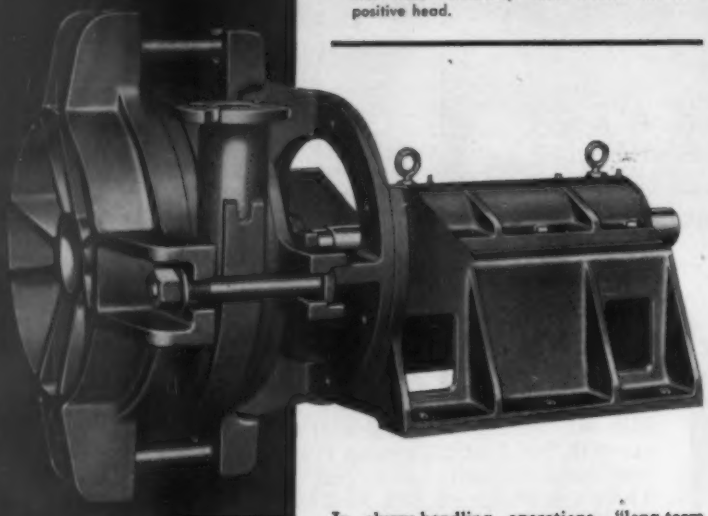
1650–56–2

LEW **LIPPMANN**

CRUSHERS FEEDERS SCREENS CONVEYORS CRUSHING & WASHING PLANTS

For Continuous Heavy-Duty Pumping

The Morris Type RX Pump shown below is a heavy-duty, low-speed all metal slurry pump expressly designed to handle abrasive slurries, chemical sludges, plant wastes etc. up to maximum fluid consistency under suction lift or positive head.



In slurry-handling operations, "long-term service" is a meaningless claim unless the pump will work day-in and day-out with a minimum of maintenance time, trouble and expense.

Morris Slurry Pumps—with an established reputation for longer life—also incorporate in their design exclusive features which result in easier installation . . . fewer interruptions to service . . . less overhaul . . . fewer replacements.

To Provide Uninterrupted Service...

The gland is under suction pressure only. This reduces leakage and dilution . . . keeps harsh abrasives out of the stuffing box . . . practically eliminates packing troubles.

There are no internal studs or bolts. Caustic and corrosive solutions cannot seep past threads and cause maintenance headaches.

Impeller removed without disturbing the piping. You simply loosen 4 outside clamping bolts and pull off the end cover. This feature alone saves considerable time and labor.

MORRIS
TYPE RX SLURRY PUMP

• Free Service. Morris Engineers will be glad to recommend the pump best suited to your needs for size, capacity, etc. Send necessary data today . . . include request for Bulletin 185.

MORRIS CENTRIFUGAL PUMPS

MORRIS MACHINE WORKS
Baldwinsville, N. Y.
Sales Offices in Principal Cities

Obituaries

WILLIAM R. HICKS, 74, retired construction superintendent for Alpha Portland Cement Company, died recently. Mr. Hicks had been associated with the firm for 38 years at the time of his retirement. He joined the concern in 1911 in Cementon, N. Y. Later he was appointed superintendent of construction at the Catskill plant, where he remained for 12 years, before assuming the duties he held at the time of his retirement.

JAMES A. ECK, 92, retired president of J. A. Eck and Sons, Inc., died on October 26 in Williamsport, Pa., where he made his home. Mr. Eck founded the sand and gravel firm in 1921 on land owned by his family and personally directed the corporation until 1945, when he retired.

THOMAS H. LINEAWEAVER, 59, who was formerly president of the Annville Stone Company, Hershey, Pa., died on October 19 in a hospital in Bryn Mawr, Pa. At the time of his death he was president of the Gray's Ferry Brick Company.

GEORGE W. JOHNSON, a retired operating engineer for the Permanente Cement Company, Oakland, Calif., died after a short illness. He was 65 years old.

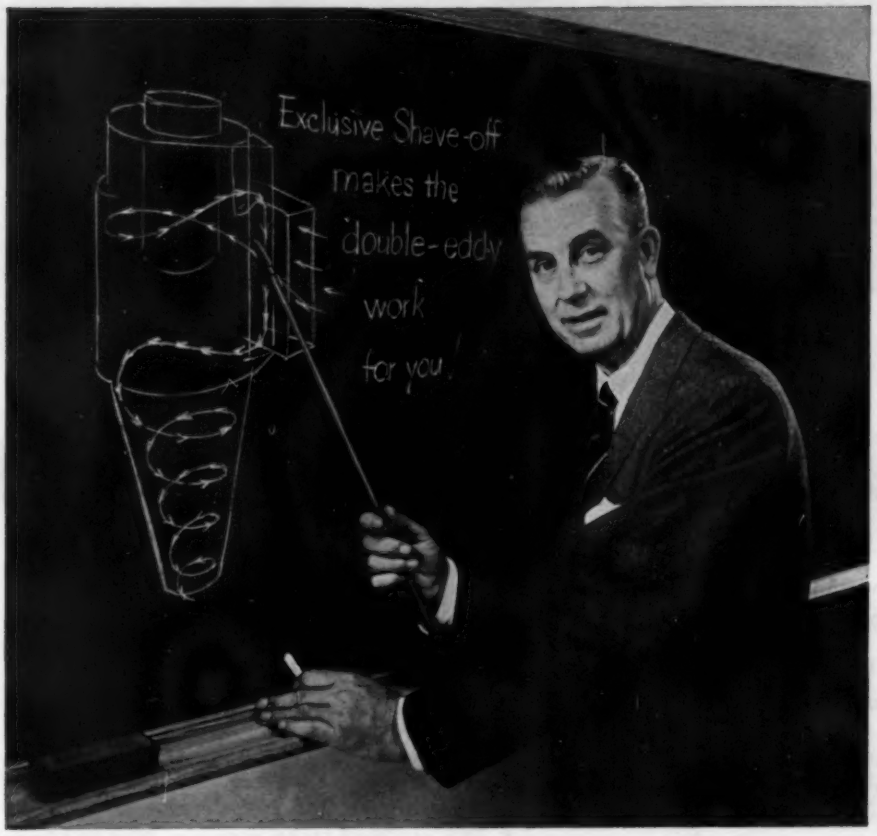
MISS HELEN MCNAMARA, owner of the Eagle Rock Lime Company, Eagle Rock, Va., who was for many years treasurer of the National Lime Association, passed away on November 11 after a long period of ill health.

Miss McNamara, with her brother, Jim, and her nephew, John McGinnis, was actively engaged in the lime business for the last 55 years.

RALPH PETERS, dealer sales manager, Western Region, for the U. S. Gypsum Company, died on September 10.

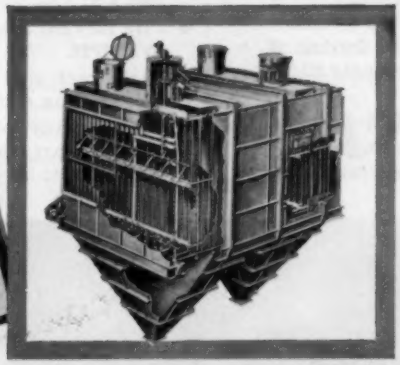
Mr. Peters had been a member of the sales staff of the fim since 1926. In 1946 he was transferred to Los Angeles as division manager, and was appointed dealer sales manager of the Western Region when it was established in 1953.

How Buell delivers the EXTRA PERCENT in Dust Collection Efficiency

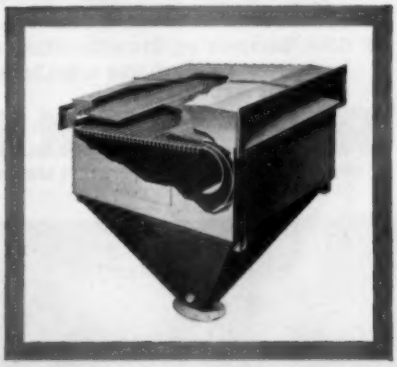


In any cyclone dust collector there is an upward eddy preventing the separation and dropping-out of a percentage of particles. But in Buell Cyclones, the exclusive Buell shave-off design *harnesses* this up-flow—puts it to work! Result: extra efficiency without extra operating cost!

For the complete story behind Buell's *extra efficiency*, write Dept 18A, Buell Engineering Company, 70 Pine Street, New York 5, N. Y.



Buell's Low Resistance Fly Ash Collector combines top efficiency with low draft loss, for either natural or forced draft installations.

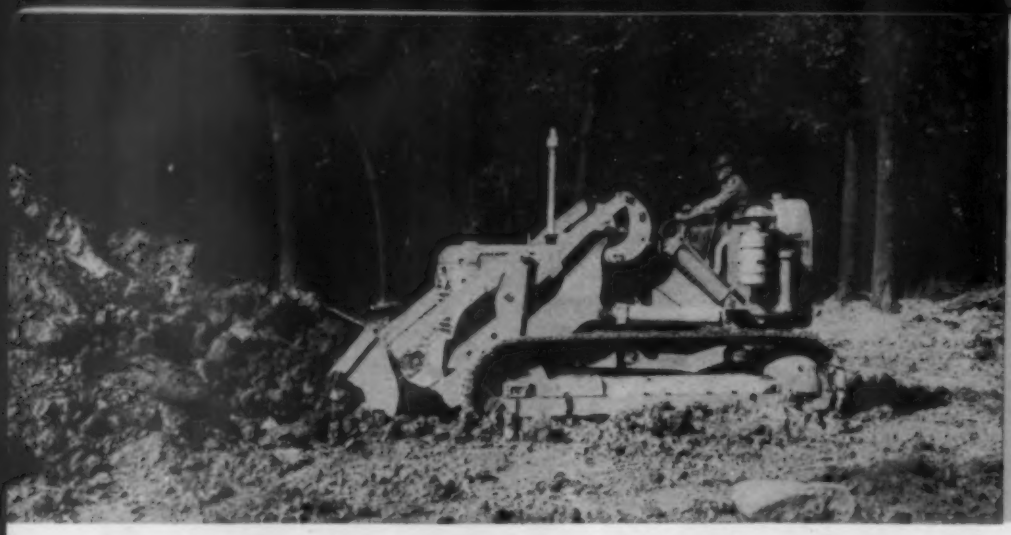


SF Electric Precipitator, a Buell exclusive, also delivers *extra efficiency* due to unique Spiralectrodes and continuous cycle rapping.

buell

MECHANICAL ELECTRICAL

Experts at delivering Extra Efficiency in **DUST COLLECTION SYSTEMS**



1

Ample power and traction to "bury" the bucket.

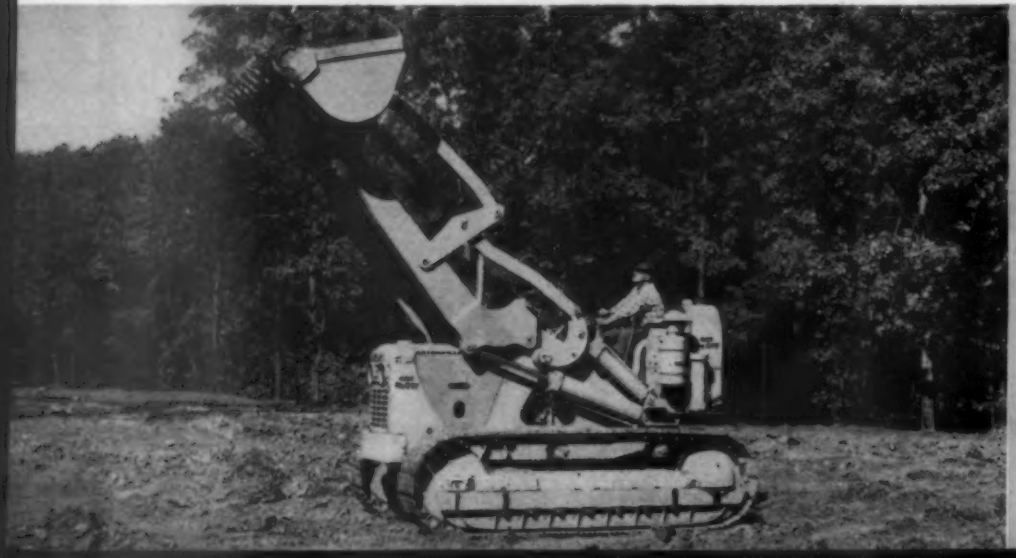
CATERPILLAR ANNOUNCES

THE NEW NO. 977

Here's the new boss of the excavator-loaders...the new Caterpillar No. 977 Traxcavator. The No. 977 has important new features which greatly increase productivity and earning power.

FEATURES OF THE NO. 977 TRAXCAVATOR

- 96-in., 2¼-cu.-yd. bucket.
- 100 HP CAT® Engine, with ample power to "bury" the bucket and lift big loads.
- Newly-designed bucket tips back 40° at ground level to retain heaping loads.
- More than 11½ ft. of dumping height make it easy to load any truck or railroad car.
- Steel bumpers on lift arms allow rapid jarring of bucket, and 50° discharge angle helps to empty sticky materials fast.
- Automatic kick-outs put bucket in "hold" position at maximum height and position bucket for digging on next pass. Easier operation and faster cycle times.
- Advanced hydraulic system, with pump protected by full flow filter.
- Hardened, spool-type operating valves located in large tank, protected from dirt or damage.
- Long-lived, trouble-free oil clutch.
- Fast, one-hand bucket operation. High seat for comfort and visibility.
- Five forward speeds to 7.4 MPH; four reverse speeds to 7 MPH.
- Each track controlled by heavy-duty dry multiple disc steering clutch and contracting band brake.
- Tools for any job: 3-yd. bucket for light material; 9-tooth quarry bucket; heavy-duty bucket; skeleton rock bucket; log and lumber fork.

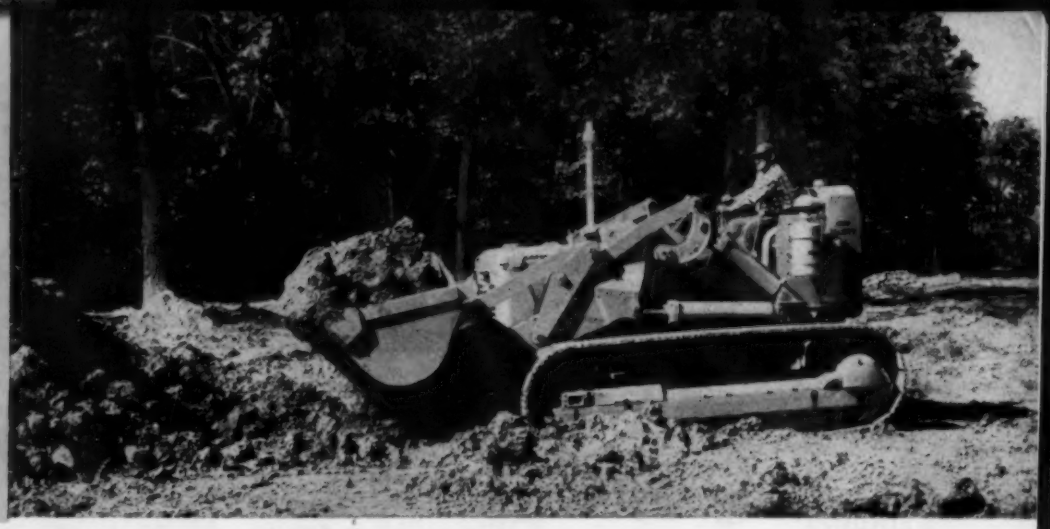


3

High lift, with over 11½ ft. of dumping height.

2

40° tip back at ground level to hold load.



TRAXCAVATOR*

MAIL TODAY!

CATERPILLAR TRACTOR CO., Peoria, Illinois, U.S.A.

Please send full information about the new No. 977 Traxcavator.

*Name*_____

*Company*_____

*Address*_____

*City*_____ *Zone*____ *State*_____

Now three sizes of Traxcavators are available for all your excavating and material-handling needs. They're *unit-built* machines, so efficient that you'll find they match or excel competitive equipment with nominally greater bucket sizes. You can choose the right Traxcavator for your job from the No. 933 (1 cu. yd.)—the No. 955 (1½ cu. yd.)—or the No. 977 (2¼ cu. yd.).

Let your Caterpillar Dealer show you how these new machines can make money and *save* money for you. Get complete information from him. Or mail the coupon.

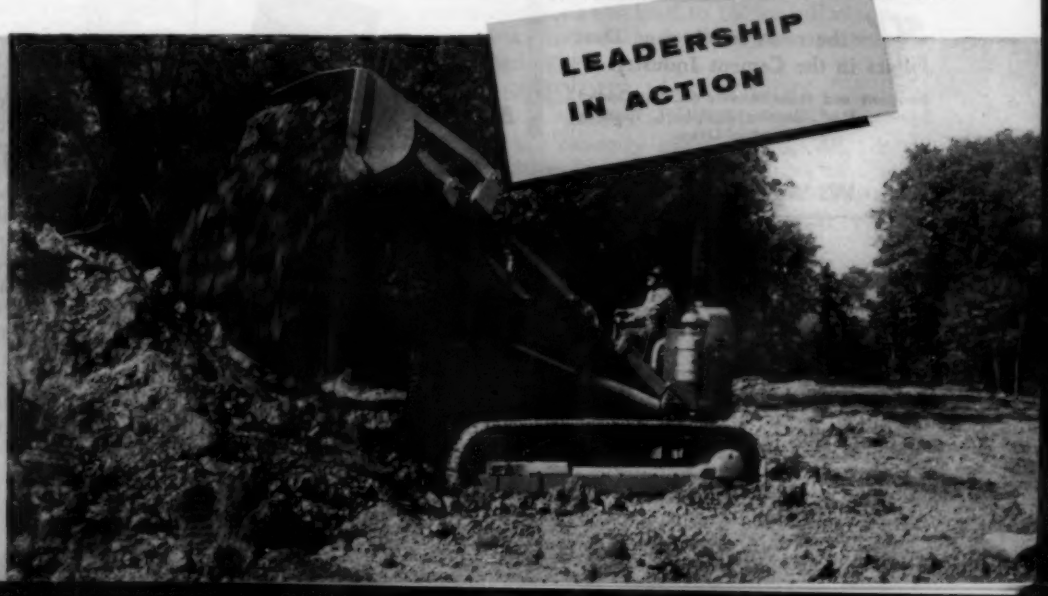
Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

4

Fast, sure dumping of sticky materials.



WHERE SLY COLLECTS DUST IN CEMENT MILL OPERATIONS

CRUSHING

GRINDING

SCREENING

SEPARATION

FEEDING

CONVEYING

ELEVATING

PACKAGING

SILO FILLING

BULK LOADING

For all these operations SLY Dust Filters are in use in hundreds of cement plants in the U. S., Canada, Mexico, South America, Cuba, Puerto Rico, Greece, Israel and other countries.

Made in various types and sizes to fit air volumes and operating conditions, SLY Dust Filters *get all the dust.*

SLY has rendered engineering service to cement plants for over 35 years. This valuable experience is available to you. Let's discuss *your* dust problem.

ASK FOR BULLETIN 98

SLY— the most widely used Dust Filters in the Cement Industry.

Designers and Manufacturers of: Dust Control Systems, Blast Cleaning Equipment, Tumbling Mills, Industrial Ovens.

THE W. W. SLY MANUFACTURING CO.

SINCE 1876

4745 TRAIN AVENUE • CLEVELAND 1, OHIO
OFFICES IN
PRINCIPAL CITIES

Please send me your Bulletin 98

NAME.....

STREET.....CITY.....STATE.....

Dodge Executive Optimistic On Construction Outlook

Further construction gains are expected by F. W. Dodge Corporation next year, although at a less spectacular rate than has been evident in 1955. Nonresidential construction volume is expected to increase sufficiently to offset an anticipated moderate decline in housing activity.

Speaking for Dodge, Thomas S. Holden, vice-chairman, expresses those opinions in November's *Architectural Record magazine.*

Referring specifically to the dollar totals of Dodge Reports of contract awards for future construction in the 37 states east of the Rockies for 1956, Mr. Holden looks for an overall 3 percent gain over this year, as compared with this year's expected 23 percent gain over 1954. He estimates the 1956 total at about $25,155,000,000; if attained, this 1956 total will constitute the eleventh consecutive year of construction volume increase.

He anticipates that Dodge's nonresidential total will go up 9 percent to reach about $9,450,000,000, and that residential will drop 6 percent to $9,890,000,000.

Mr. Holden expects that non-farm dwelling unit starts may drop 10 percent below this year's expected total of 1,325,000, resulting in a 1956 total for the 48 states of approximately 1,190,000 units.

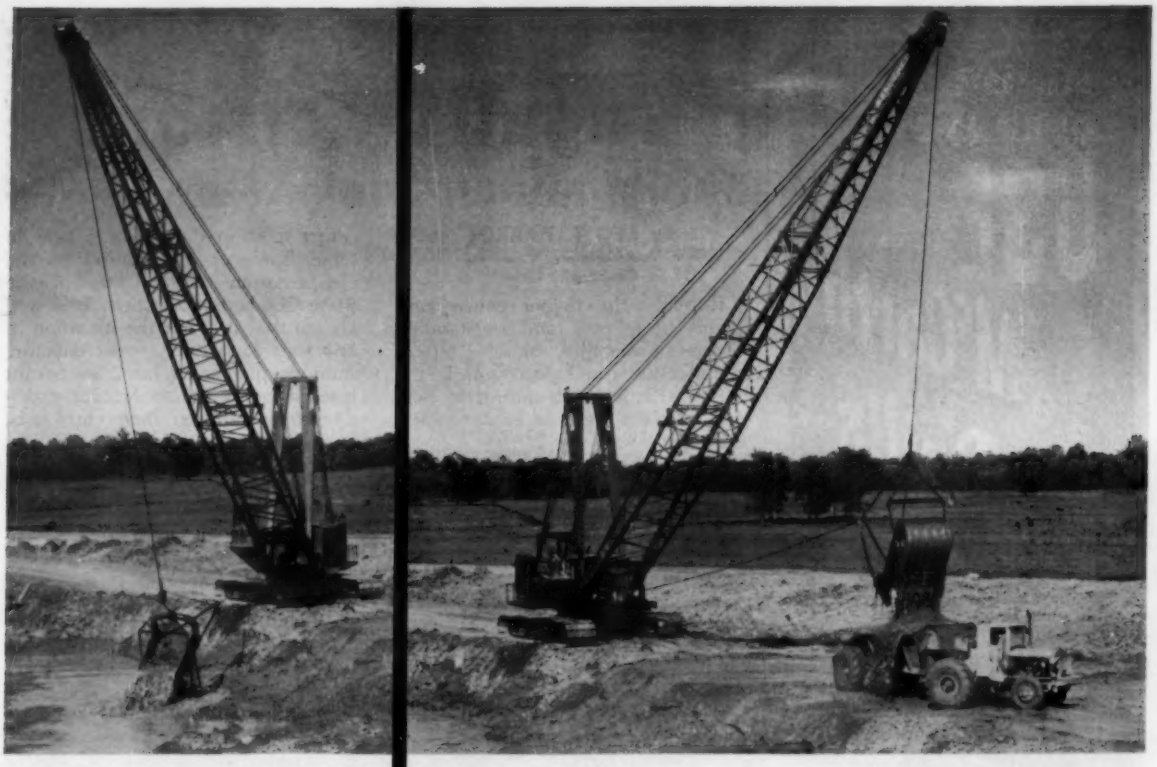
Contract awards for utilities and public works are expected to total about $5,815,000,000, up 13 percent, in the 37 eastern states.

These estimates indicate a roughly proportional leveling off in the government figures for construction put in place, as the contract awards tend to lead construction activity.

A 2 percent decline is expected in square footage physical volume of contract awards next year, as allowance has been made for moderately rising construction costs and improvement in the quality of structures.

Detailed square footage estimates are made in nine categories of building. They are: commercial, up 6 percent; manufacturing, up 12 percent; educational and science, up 10 percent; hospitals and institutions, up 7 percent; public up 5 percent; religious, up 5 percent; social and recreational, up 9 percent; miscellaneous nonresidential, up 7 percent; residential, down 8 percent.

Mr. Holden states that the economists polled generally expected 1956 rises in gross national product and in industrial production, but more moderate in degree than those experienced in 1955.



Manitowoc mobility and stability delivers big yardage at Dutch Gap

To keep material moving at a rapid rate into its screening and processing plant, Southern Materials Co., Chester, Va., uses a big capacity Manitowoc 4500 dragline to get the job done fast, at lowest cost. This massive Manitowoc, equipped with a 5-yd. perforated bucket, delivers to loading units an average 12-yds. of sand and gravel from the James River every 3 to 4 minutes. A 120′ boom provides extended reach for full buckets at maximum working range.

MONEY-SAVING MOBILITY

Here's a 5-yarder that's as mobile as a lightweight — with the stability and balance you need under all conditions. Wide, 60″ pads and lowest bearing pressure make traveling easy in soft going. The absence of cumbersome electric trailing cables speeds movement on the job. Thousands of hard-to-maintain electrical wires and components are eliminated by the effective diesel unit drive pioneered by Manitowoc. The entire unit can be shipped by railway cars or highway trailers and assembled in days rather than the weeks required for other machines of comparable capacity.

MAXIMUM OPERATOR CONVENIENCE

Air controlled throughout for all operating clutches and brakes to lessen operator fatigue. Torque converter available to balance power to load for peak performance with or without first-class operator. Elevated pilot house raises operator's eye level to 15′ for full vision over banks and makes for fast, sure spotting when loading.

SEE YOUR MANITOWOC DISTRIBUTOR

Want a big capacity machine with all the finest features in your pit? Then get all the facts on the Manitowoc 4500. MANITOWOC ENGINEERING CORP., MANITOWOC, WIS.

MANITOWOC

SHOVELS 1 - 5½ YD. Speedcrane CRANES 20-100 TON

MINING OPERATORS USE McCarthy Drills

Heavy-Rugged-Powerful

AT Bessemer Limestone & Cement Co., Bessemer, Pa., one McCarthy unit (above) averages 90 ft. per hour, drilling through hard blue shale and sand rock 34 ft. deep. Blast holes are drilled on 18-ft. centers. Two men handle the whole job, including setup and moving. McCarthy drills operate with gasoline, diesel or electric power units . . . on all types of mounts. McCarthy "money-savers" can work for you. See your nearby distributor or write Salem Tool direct for further information.

SALEM
THE SALEM TOOL CO.
1901 S. ELLSWORTH AVE.
SALEM, OHIO · U. S. A.

Legal Decisions

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

Recently the higher courts rendered many new and outstanding decisions affecting buyers, sellers, manufacturers and processors in the nonmetallic minerals industries. Several of these new decisions reverse the older law.

Some time ago an official of a large quarry company inquired whether or not an injured employee can sue for damages, instead of accepting compensation allowed by the State Workmen's Compensation Act. A few weeks ago a higher court rendered an unusually important decision on this subject of law.

First, it is important to know that in some cases employers have paid premiums for state industrial insurance and yet heavy damage allowances, amounting to thousands of dollars, were awarded by the higher courts to injured employees, and in some instances in addition to the compensation allowed under the State Compensation Laws. It is well known that it is not the intention of any state legislature, when enacting state compensation laws, to permit injured employees to recover excessive damages from their employers, or damages in addition to the lawful compensation. Generally speaking, if employers understand and abide by state compensation laws, they have ample protection against company-wrecking damage allowances; and employees must accept the reasonable amounts of compensation specified by state laws.

On the other hand, failure of an employee to abide strictly by these various state laws very frequently forfeits his legal rights to compel the injured employee to accept specified reasonable compensation, instead of suing for heavy damages.

"No. 1 ROCK BUSTER"

specially designed for QUARRY OPERATIONS

"Cape Ann" FORGED STEEL DROP BALL

- RUGGED DESIGN
- GREATER IMPACT
- ECONOMICAL

Used and approved by leading quarrymen everywhere, the "Cape Ann" Drop Ball is available in weights from 2000 to 12000 lbs.

It has a forged connecting link, protected by deep recess, for swivel or shackle. Strong alloy steel pin. Low cable replacements. Furnished complete as shown.

Full Details sent on request

Cape Ann Anchor & Forge Co.
Gloucester • Massachusetts

"Our TD-14A DROTT rips out

CONCRETE SLAB and FOOTINGS

a ¾-yard power shovel couldn't touch"

—Pangia Construction Company, Atco, New Jersey

Smack 8-inch-thick slab, or 5-foot-deep footings, of pipe-laced concrete with the 17,000-pound break-out force of an International Drott TD-14A. And something's got to give!

The pictures tell you what gives as this TD-14A Skid-Shovel, owned by Pangia Construction Company, Atco, New Jersey, slams through a 150-cubic yard concrete excavation job—for a new Sinclair station in Camden.

"We are ripping out concrete slab and footings that a ¾-yard power shovel couldn't touch," reports Owner Albert J. Pangia. "The operation is fast because of the breakout action. We use our TD-14A Drott Skid-Shovel for everything."

• Why not size-up these big advantages that give you new loader job range, yardage capacity, and profit opportunities? See your International Drott distributor for a Skid-Shovel or Four-In-One demonstration!

No other loader has it!

Apply the scientific lever principle of *exclusive and patented pry-over-shoe break-out, plus ground-level bucket roll-back.* And an International Drott Skid-Shovel gives you up to three times as much concrete-smashing, frost-breaking, boulder-bucking break-out force as other front-end loaders can deliver. *No other loader even has skid-shoes!*

This great hydraulic pry-out power over big skid-shoes shunts stresses directly into the ground, too —so they can't maul bucket or tractor.

And only an International Drott has the shock-swallowing protection of patented Hydro-Spring—that reduces the effects of carrying, dumping, or other impact forces to *operator* and *tractor* by 67 per cent, or more—increases equipment life by a reported 25 per cent. *Hydro-Spring also eliminates most hydraulic hose failures!*

INTERNATIONAL HARVESTER

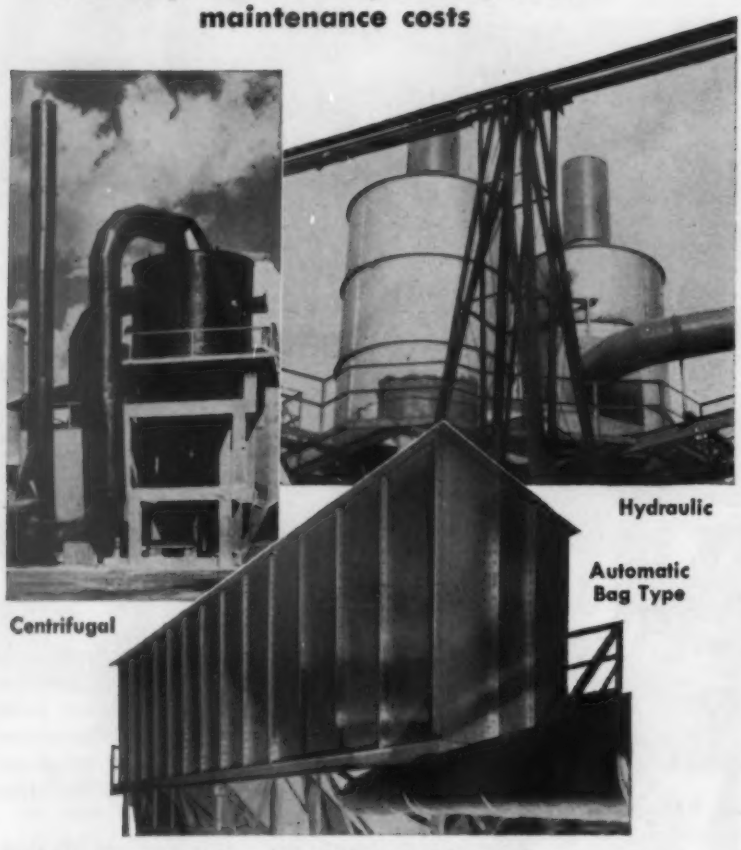
INTERNATIONAL®

DROTT

Norblo

Dust and Fume Collection Systems

make outstanding records for high recovery with low operating and maintenance costs



Centrifugal

Hydraulic

Automatic Bag Type

These three important types of Norblo collecting systems, frequently used in certain combinations, bring you economical, dependable control as required in a wide range of industries. "Guaranteed Efficiency" is not an empty phrase at Norblo. We stand back of every installation that's used for the purpose and at the capacity for which we designed it. All component parts are made by Norblo, under controlled specifications.

For more than 40 years Norblo has engineered and supplied installations of every size in the rock products, smelting, chemical, metal working, milling and processing fields. It pays you to get the facts about Norblo Dust and Fume Collecting Systems. Give us a description of your problems.

The Northern Blower Company

Engineered Dust Collection Systems for All Industries

6407 Barberton Ave. OLympic 1-1300 Cleveland 2, Ohio

For example, various state laws provide that in the event the employer fails to post in conspicuous places the notices of insurance he carries, no employee "shall be deemed" to have accepted the provisions of the workmen's compensation law, and the employee may decide either to accept compensation under the State Workmen's Compensation Act or to sue the employer for damages.

For illustration, in *Jeune v. Del E. Webb Construction Company,* 265 Pac. (2d) 1076, it was shown that the Webb Construction Company was constructing a warehouse in Tucson, Ariz., to be used in connection with the erection of a housing project. That afternoon a strong whirlwind caused the warehouse to collapse while an employee was working on it, causing him to suffer serious injuries.

After the injury the employee signed and executed the usual compensation claim for compensation and medical benefits, which were filed with the Arizona Industrial Commission. Several weeks after the filing of the claim the employee interviewed his attorneys. Thereafter he decided to sue his employer for damages, instead of accepting compensation provided by the State Workmen's Compensation Act. The employee contended that he had this privilege because the employer failed to post in his main offices the insurance notices furnished by the State Industrial Compensation. However, as the employee failed to prove *positively* that the employer failed to post these notices, the higher court held that the employee could not sue for damages but must accept the compensation allowable by the State Workmen's Compensation Act. This court said:

"Appellant (employee) having failed to prove that the notices were not posted, is not entitled to maintain a common-law action of negligence in this case."

Nevertheless, this higher court clearly explained that if testimony had proved that the employer had failed to post the insurance notice on the conspicuous walls of his office, as required by the laws of the state, the employee could have sued and recovered heavy damages, instead of accepting relatively small compensation allowed the employee under the State Workmen's Compensation Act.

The law is established that an injured employee may sue and recover damages instead of accepting compensation specified by the State Workmen's Compensation Act, if he

prove that prior to his injury the Workmen's Compensation notices or posters required by state laws were not posted on the employer's premises in conspicuous places. The importance of this law is that if the employer forgets to post these notices, or the Industrial Commission fails to send the notices to the employer, the latter is guilty of violating the law; and the employee need not accept compensation payments for his injuries, but sue for damages. The law books are full of suits filed by employees against employers who fail to conform strictly with this particular provision of usual state laws.

$32,000 Damages for Hand Injury

Recently a higher court awarded $32,000 damages to an employee who injured his hand while working on a boat which transported stone.

See *Hudgins v. Gregory,* 219 Fed. Rep. (2d) 257. Here the testimony showed these facts: One Gregory was employed to assist in the operation of a boat. This was Gregory's first experience on a boat. He leaned over the side of the boat and with his left hand grasped a cable. The movement of the cable drew Gregory's left hand up into a fulcrum and so injured his hand that it was necessary to amputate the thumb and index finger. Gregory brought suit against the owner of the boat to recover for these injuries.

The jury awarded Gregory $32,000 damages and the higher court approved the verdict, saying:

"There is no merit in the boat owner's contention that the verdict of $32,000 is clearly excessive and without basis in fact. The record shows that the injuries suffered by Gregory have caused a 75 percent loss of the use of his left hand. His life expectancy is 37 years. In short, we think the record as a whole contains ample evidence to support a verdict of $32,000. While this amount may, at first blush, seem excessive, we cannot say it was so arbitrary as to show passion or prejudice on the part of the jury."

Note also the following late higher court decisions.

In *Meloy v. Texas,* 263 Pac. (2d) 879, it was shown that an employee received an injury which interfered with his ability to walk normally. He sued his employer for damages. The higher court awarded the employee $65,000 damages.

In *Wills v. Mex,* 264 S. W. (2d) 518, a jury awarded $82,000 damages to a 29-year-old employee who suffered compound fractures of his shoulder.

In *Cameron v. Evans,* 62 N. W.

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(2d) 793, the higher court allowed a person $21,000 damage for a partial-disability spine injury.

In *Stanford v. Freight,* 117 Fed. Supp. 903, the Federal Court awarded an employee $150,000 for injuries which paralyzed his legs.

In *Chambers v. Tobin,* 118 Fed. Supp. 555, the higher court allowed $30,000 damages to an employee for a permanent injury to his arm.

$100,000 to Contractor's Employee

A few weeks ago a higher court rendered an unusually important decision to the effect that a cement company which had high-voltage power lines on its premises is liable in $100,000 damages for burns received by an employee of a contractor who was doing repair and alteration work on the cement company's premises.

For illustration, in *Boehm v. Portland Cement Company,* 282 Pac. (2d) 69, the testimony showed facts, as follows: The R. Portland Cement Company owns and operates a plant for the manufacture of cement on a plot of about 6 acres of ground. A contract was made between it and the H. Company to make certain alterations and construction work on the plant and premises. Officials of R. Portland Cement Company knew that H. Company frequently used cranes with 60-ft. booms in its work; they also knew that much of H. Company's work was done at night.

One night when an employee of the H. Company was using a crane to repair a rock crusher, the crane came in contact with a three-wire power line carrying 33,000 volts for the use of the R. Portland Cement Company in its plant. This man was severely burned. In holding the R. Portland Cement Company liable to the victim for $100,000 damages, the higher court said:

"It was the duty of the defendant cement company to use ordinary care to furnish plaintiffs with a safe place to work. The general rule is that an owner of premises who permits a workman to come on the premises for the performance of work for the benefit of the owner is required to use ordinary care to supply him with a reasonably safe place in which to work, and to warn him of any existing danger which he knew or, in the exercise of ordinary care, should have known."

Read Your Insurance Policies

The owner of a monument works recently stated this problem: "I hold an insurance policy which is supposed to give me adequate protection against fire losses on *all* buildings on my premises. I was so informed by the insurance agent who solicited my insurance business. Now the company refuses to pay a fire loss on a frame warehouse because it is not included in the policy. What can I do to compel the insurance company to pay this loss to me?" My answer is: The insurance company is not liable.

There is no doubt that failure to read an insurance policy carefully may result in a heavy financial loss to the policy holder. This is so because the ordinary and average businessman relies upon his insurance agent to provide requested protection; and negligence of the insurance *agent* is not negligence of the insurance *company.* It is well to realize that you are not protected under promises made by your insurance agent, because the courts hold that the insurance *policy* is your only protection. All courts hold that contracts of insurance must be construed according to the terms of the contract or policy. Failure of the holder of an insurance policy to read the policy is no excuse for reliance on a promise made by the ordinary insurance agent. See *Hadro v. United Guaran-*

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MOLYKOTE TYPE BR2, an all-purpose grease manufactured by *Alpha Molykote Corporation,* is fully described in a two-page, two-color bulletin, No. 101. Compounded with a lithium base and Molykote Microsize powder, Type BR2 provides molybdenum disulfide film on bearing surfaces, operating range of BR2 is from minus 30 deg. F to plus 250 deg. F. (1)

MONA INDUSTRIES, INC., *Chemical Division* has increased its production capacity by 300 percent to meet the increasing demand for many of its line of surfactants, detergents, wetting agents, emulsifiers, and dispersing agents. Increased production necessitated the expansion of plant facilities, which have been completed. (2)

BELT CONVEYORS made by *Kilroy Company, Inc.,* are described in a Bulletin BC 2000. Illustrated are all eight of the belt conveyors manufactured by Kilroy, which are engineered with variations for individual installation to meet specific requirements. (3)

KILN DOOR GASKETS, Rubber-To-Steel Cement, and Uni-Coat, a rust preventive coating are described in "3 Corkers," a new bulletin published by *Universal Door Carrier, Inc.* The gaskets are of butyl rubber not susceptible to chemical change. Rubber-To-Steel Cement is also of a new highly compound base and was developed exclusively for binding rubber to steel. Uni-Coat offers great resistance to abrasion, chipping and the corrosive action of water, steam, and most acid or alkalin chemicals. (4)

HARDSURFACING ALLOYS manufactured by *Coast Metals, Inc.,* are discussed in a new booklet published by that corporation. Two years of research and field testing went into the development of Coast Metals' new line of surfacing materials which are being produced to meet the demand for higher-alloy hardsurfacing at lower cost. (5)

SUPER SERVICE VIBRATING SCREENS are presented by *Pioneer Engineering Works, Inc.,* in a 20-page booklet describing the 11 standard sizes of single-mounted and four standard combinations for tandem-mounted vibrating screens. All 15 screens are adaptable to a wide range for use in screening virtually all types of material. (6)

HARD-FACING PASTE, squeezed from a tube like tooth-paste directly to the part, then permanently fused on simply by heating with a torch, is a new *Western Carbide* development. It is fully described in a bulletin now available. Hardness ranges from 55 to 61 on the Rockwell scale. (7)

BULK WEIGHING SCALE Model E-50, manufactured by the *Richardson Scale Company,* is presented in a six-page bulletin offered by the company. Model E-50 is electrically controlled and pneumatically operated while being completely automatic in its operation. It will weigh nearly all dry, granular, small lumpy, crushed and powdered materials. (8)

LEE TRUCK LIFTS produced by the *Automotive Equipment Manufacturing Company,* are new in design with a cut-away frame to facilitate the lifting of trucks with restricted front axle clearance. The manufacturer claims a 70 percent savings in manual labor, eliminating the need for pits and creepers while the mechanic workers in an upright position, either in or out-of-doors. (9)

DENVER TYPE "J" portable and semi-portable crushing plants are product presented in the *Denver Equipment Company's* recent bulletin, C12-B16. These plants are rugged, completely self-contained and can be moved and made ready for operation in a short time with the latest improvements now featured on all Denver crushers. (10)

CENTRALIZED LUBRICATION is discussed in the publication of the same name which has been printed by the *Farval Corporation.* The Farval System of centralized lubrication is a simple and practical method which can be manual or automatic on either old or new machinery. (11)

RUBBER LATTICE MOUNTINGS are the topic discussed in a bulletin now being distributed by the *Lord Manufacturing Company,* makers of Lord Bonded Rubber Lattice Mountings. The booklet depicts the mountings in use on a vibrating screen and on a heavy motor generator. Capacity of this mounting is from 250 to 3,000 lb. per mounting. (12)

AIR-ACTUATED CLUTCH Model PO is fully described in the *Twin Disc Clutch Company's* most recent bulletin. Advance design in Model PO opens possibilities for development of machinery operating at higher speeds with less inertia and greater efficiency. (13)

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CONVERTA-SCREEN HEATING equipment is the subject of *Screen Heating Transformers, Incorporated's* new bulletin. Converta-Screen heaters are easy to install, keep sizing uniform, enable 800 percent longer life, heat any deck, prevent dust damage, and are safe and shockproof. (14)

UNIT CHALLENGER Model 510, manufactured by *Unit Crane and Shovel Corporation,* is described in that company's 12-page bulletin which is now available. The bulletin, C-800 and completely illustrated, shows such detail features as hydraulic actuated clutch control, full floating trunion taper drums, self-aligning hook shoes and force feed lubrication. (15)

HEAVY DUTY CLUTCHES manufactured by the *Rockford Clutch Division of Borg-Warner Corporation* are now available under the trade name "Morlife." These clutches provide up to 100 percent more torque capacity and permit the use of smaller diameter clutches. (16)

THICKNERS, CLARIFIERS and Agitators for mining, metallurgical, chemical, and other industrial processing operations are described in a 16-page catalog distributed by *Hardinge Company, Inc.* The catalog discusses applications and construction of Auto-Raise Thickners, circular and rectangular clarifiers, agitators, and related equipment. (17)

CORROSION CONTROL is the subject of *Harco Corporation's* publication, "Cathodic Protection Systems for Corrosion Control." The corrosive effect caused by the galvanic action of metals in contact with earth and water and the principles used by the Harco System to halt existent corrosive action is revealed in story and illustration form. (18)

WIRE ROPE SLINGS are featured in a bulletin prepared by the *Wickwire Spencer Steel Division of the Colorado Fuel and Iron Corporation.* Dura-Grip wire rope is illustrated in various assemblies of slings which can be used with a complete listing of dimensions and rated capacities. (19)

TOURNATRACTORS, manufactured by *LeTourneau-Westinghouse Company,* are the text of a new booklet published by that company. Powered by a 186 or 208 hp. engines, a Tournatractor is capable of traveling at a speed of 19 mph. (20)

BELT CONVEYOR CARRIERS AND TRIPPERS are discussed in a booklet put out by the *Stephens-Adamson Manufacturing Company,* producers of the equipment. Carrier units along with accessory equipment and special tripper spouts are featured in photographs with full editorial and operational data coverage. (21)

"CATERPILLAR SCRAPER No. 463," most recent publication of the *Caterpillar Tractor Company,* is now available. "No. 463" is a four-wheel crawler scraper with a new low bowl design, giving bigger and faster loads. Other new features are higher apron lift and greater ground clearance to aid loading and spreading efficiency. (22)

AIR TOOLS manufactured by the *Le Roi-Cleveland Division* of the Westinghouse Air Brake Company, are now green in exterior color. Formerly painted gray, the air tools will now be painted green to fulfill the need for a more readily identifiable product. (23)

DUROLITE BLOCKS and wire rope fittings are described in bulletins 163 and 164 put out by *Sauerman Brothers, Inc.* Bulletin 163 features the blocks in sizes from 6 to 42 in., with extra wide sheave grooves permitting use of larger cable. No. 164 contains tables, drawings and other information for open and double wedge sockets in rope sizes from ⅜ in. to 2 in. (24)

HIGH PRESSURE POWER PUMPS and truck cleaning equipment are the features of the *John Bean Division, Food Machinery and Chemical Corporation,* new booklet. The many industrial pumps, primary uses, and the high pressure Bean Aquablast Washer are shown in action. The washer has a driving stream of high pressure spray at 600 lb. per sq. in. and is easily directed for cleaning all parts of machines. (25)

HD-6 DIESEL-POWERED CRAWLER TRACTORS are the subject of the *Allis-Chalmers Manufacturing Company's* newest booklet (MS-461) "HD-6." The HD-6 is a 45 drawbar hp. crawler with a forward speed of 1.5 to 5.5 mph. Belt power on this tractor is 55 hp. which is aided by a 24-volt direct electric starter. (26)

TRENCHOE SHOVELS, manufactured by the *Little Giant Crane Company,* feature a new clutch assembly, ball bearing turntable, cable drums, swing drums, crawler base, and the goose neck boom. Engineered for extra power and greater endurance, the Trenchoe offers maximum economy, speed, stamina and stability. (27)

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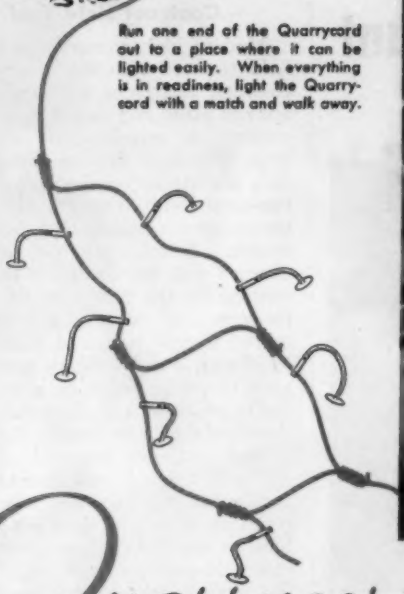

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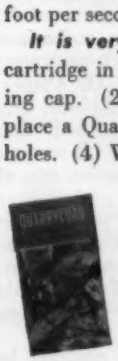

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ty Company, 124 N. E. (2d) 370, in which the court said:

"Since the policy in this case contained a specified and limited coverage of liability and excluded damage by fire therefrom, the court properly entered judgment for the defendant (insurance company)."

Contract Held Void

Modern higher courts consistently hold that all contracts with states, counties, and cities, are void which are not made and signed exactly according to requirements of state laws. This is so because public officials discharging duties and making contracts with respect to public money are not dealing with their own money. Hence, all persons are charged with knowledge of the laws enacted for the protection of public property and money, and are required to take notice of these laws. Moreover, public officials act in regard to public funds in a trust capacity as servants of the public; and therefore their acts beyond the scope of their authority are void.

The fact that a contractor or other person performed services or supplied materials to a city does not entitle him to payment, if the testimony shows that the contract under which the services or materials were supplied was unauthorized and void.

For example, in *Fulton v. City of Lockwood,* 269 S. W. (2d) 1, the testimony showed that a state law provides that no county, city, town, village, or other municipal corporation shall make any contract, unless such contract shall be in writing and authorized by the board of aldermen.

Further testimony showed that the mayor of a city wrote one Fulton, stating he would be glad to hear from him if interested in a sanitary sewerage system the city was thinking of constructing. After some correspondence Fulton mailed to the mayor two copies of an employment contract, which he expected the proper city officials to execute. This contract was never signed and approved by the aldermen who were authorized by state laws to sign such contracts; it was signed by "T. D. Combs, Mayor," and "Ray W. Abbiatti, City Clerk." The contract stated that Fulton would receive for his services 6 percent of the construction cost of the improvement.

Fulton proceeded to perform his work. When the city refused to pay him, he filed suit. The higher court refused to hold that Fulton could collect any payment for his services, and said:

"The execution of a contract by the mayor and city clerk with plain-

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"Tops for stripping overburden," reports Maurice Stein, Superintendent for Elliot Coal Mining Company, Philipsburg, Pennsylvania, of his company's TD-24's. "We've used two for three years now . . . find they give maximum output with very low maintenance. Our operators especially like their ease of handling and good balance. We also like their planetary steering system which lets our operator safely work on steeper terrain." Right now, rigs are removing 40 ft of shale and clay to uncover a 24-inch vein of "C" seam bituminous coal.

For utility work around pit or plant, 39½ dhp International 300 can be equipped to do most any task. Here, rig loads and unloads trucks. With other attachments, "300" plows snow, blades roads, loads bulk materials, digs ditches, mows grass, tows trailers. Rig has 10 speeds forward to 16.7 mph, develops 4,379 lbs pull.

Fast on job, fast between jobs—Handling all tractor work in a quarry near Denver, Colorado, 200 hp TD-24 saves time by driving from job-to-job at 7.8 mph. Output, 2200 tons of 1¼-inch stone per 8-hour shift, is taken from crusher by International-powered belt conveyor, background, then stockpiled by TD-24. Unit also does all stripping.

"Ideal for dozing rock," says Paul Weaver Supt for Joe Wenke Quarries of this veteran TD-14A. "We use it continuously for shovel and quarry-floor cleanup. Performance has been excellent. Downtime is way down due partly to rugged construction, partly to prompt parts delivery and service from our International distributor." Quarry, located at Toledo, Iowa, produces 200 tons of 1-inch road stone per hour.

3000-ft cycle every 3 min is the record of Western Construction Co.'s "55" Payscraper. This includes time for TD-24 to push-load 10 bank yds of ripped caliche. Payscraper's fast-loading ability makes it ideal for stripping overburden . . . high ratio of horsepower to loaded weight, oversize air brakes speed hauls up and down steep grades. Photo was taken near El Paso, Texas.

Loader does job too tough for shovel—In an assignment which dramatically illustrates the tremendous break-out International Drott can bring to bank-loading, Al Pangia's TD-14 rips up a 150-yd concrete filling station driveway in Camden, N. J. Engineers say a ¾-yd shovel could not have done the work . . . yet TD-14 broke and loaded the slab unassisted.

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tiff (Fulton) was never authorized. The protection of the public and the declared public policy requires public officials to comply with statutory provisions, and such requirements may not be avoided by a compliance only when the official sees fit to comply."

Not an Attractive Nuisance

The higher courts consistently hold that the owner of real property always is liable in damages for injuries to children who are "attracted" to the premises. However, a late higher court held that a building in course of construction is not an "attractive nuisance."

For illustration, in *Guelda v. Hays & Nicoulin, Inc.*, 267 S. W. (2d) 935, it was shown that a 12-year-old boy slipped and broke his leg on the muddy basement floor of an office building under construction. The testimony showed that the boy had climbed through a ground-level basement window and in stepping down to the dirt floor 2 ft. below slipped and broke his leg.

The boy's father sued to recover heavy damages on the contention that the owner of the building and the contractor were negligent because of failure to employ a guard to warn children of the dangers and keep them off the property. The boy's father also argued that the building owner was negligent because (a) the building owner should have known children were likely to trespass; (b) the condition is one of which the building owner knows or should have known involved an unreasonable risk of death or serious bodily harm to children.

It is interesting to observe that the higher court held the building owner not liable in damages for injuries to the boy, saying:

"We do not think it can be said that a muddy basement floor in a partially constructed building constitutes an unreasonable risk of death or serious bodily harm to children who might be attracted to the building."

Must Use Care

A contractor asked this question: "If a subcontractor sustains an injury due to defects in a building, is the building owner liable in damages to the subcontractor?"

For example, in *Thomas v. Schwab*, 211 Fed. (2d) 639, it was shown that one Thomas was a subcontractor in connection with the construction of a dwelling for one Schwab. The carpentry work was under subcontract to another subcontractor, and this work included

Mack B-60T with trailer hauling Marietta precast concrete panels (approx. 3,200 lbs. each) to construction site.

Marietta relies on **MACKS** to deliver big precast concrete panels on schedule

When a contractor is ready to erect precast concrete siding, deliveries must be made promptly on schedule.

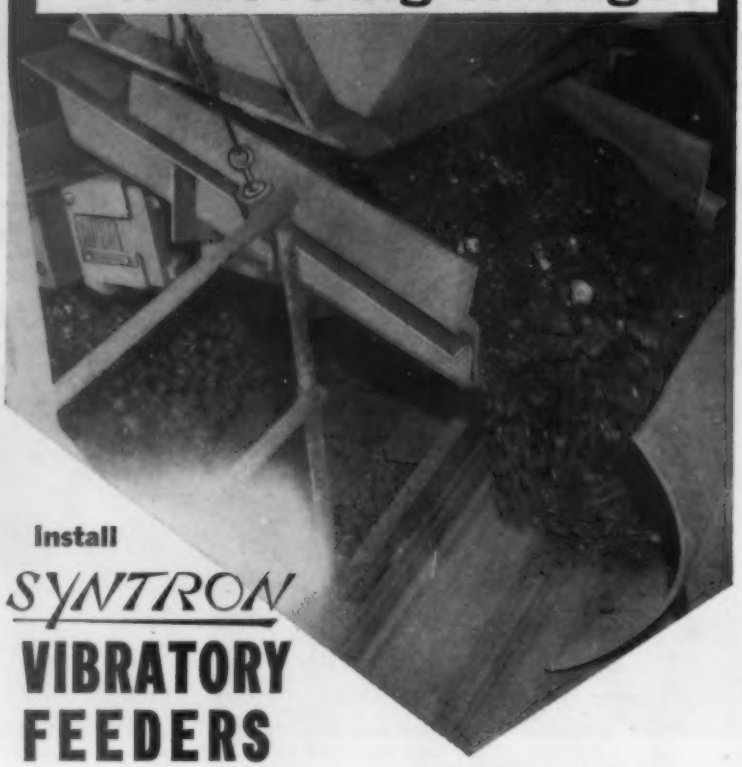
That's why the Marietta Concrete Corporation of Marietta, Ohio, chose Macks. They were convinced that these rugged, dependable tractors would maintain a steady flow of their unique concrete-and-insulation "sandwiches" from production line to building sites.

Marietta uses Mack B-60T's with special trailers to transport these big precast concrete insulated wall panels, which measure up to 8′ x 20′, and weigh 3,200 lbs. and more. Although many deliveries are made as far away as 200 miles over all types of roads, Macks' dependable and versatile performance keeps these big slabs rolling on schedule.

Whenever maintaining tight schedules is of the utmost importance, you can depend on Macks' stamina and roadability for round-the-clock reliability. And you can count on Mack Thermodyne® Diesels for unmatched fuel economy. It will certainly pay you to find out how Mack can help you make more money on the *important* jobs . . . the *Mack-sized* jobs. Contact your Mack Branch or Distributor today.

MACK TRUCKS Empire State Building, New York 1, N. Y. 3604

. . . the economical way to move big tonnages



Install

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VIBRATORY FEEDERS

- Finger-Tip Control
- Electromagnetic Operation
- Uniform Feeding

Assure efficient, controllable, low cost handling of most bulk materials from coarse, heavy lumps to fine powders. Handle up to hundreds of tons per hour on continuous production schedules with little or no maintenance.

Other SYNTRON Equipment for Low Cost Production

SHAFT SEALS

Self-lubricating, mechanical seals for rotating shafts. Provide positive sealing of gases and liquids. Corrosion resistant.

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For controlled accurate feeding by weight. Load variations corrected automatically.

FEEDER MACHINES

Complete with storage hopper, vibrator and feeder. For controlled feeding of bulk materials.

VIBRATING GRIZZLIES

High speed, controllable feeding and scalping in one operation. Clean, low cost separation of materials.

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SYNTRON COMPANY

385 Carson Avenue Homer City, Penna.

the installation of the windows. One day Thomas went through a window, holding on to the casement of one window to steady himself. This casement had been temporarily secured in place by the carpenters, and its installation was not complete. The casement gave way in Thomas's hand, and he lost his balance, fell first to the roof and then to the ground, and was very seriously injured. Thomas sued Schwab for heavy damages.

It is interesting to observe that the higher court refused to award Thomas any damages, saying that he was negligent in failing to use due care for his own safety when knowing that other subcontractors were doing work on the building.

Intoxicated Driver

According to a late higher court decision, a motor truck driver who kills a pedestrian or an occupant of another car while partly intoxicated may be convicted of the crime of manslaughter. Also, his employer is liable in damages.

For instance, in *People v. Mead,* 271 Pac. (2d) 619, it was shown that an automobile driver named Mead was intoxicated when he had an accident which killed a person. The higher court upheld his conviction by the lower court on the charge of manslaughter, and said:

"The odor of alcohol about him, the blood analysis showing a high alcoholic content, and the medical testimony evaluating the blood analysis, all support the jury's implied finding that appellant (Mead) was under the influence of intoxicants, if not intoxicated, when the accident occurred."

Other recent higher courts have held negligent drivers of motor vehicles guilty of murder, under similar circumstances."

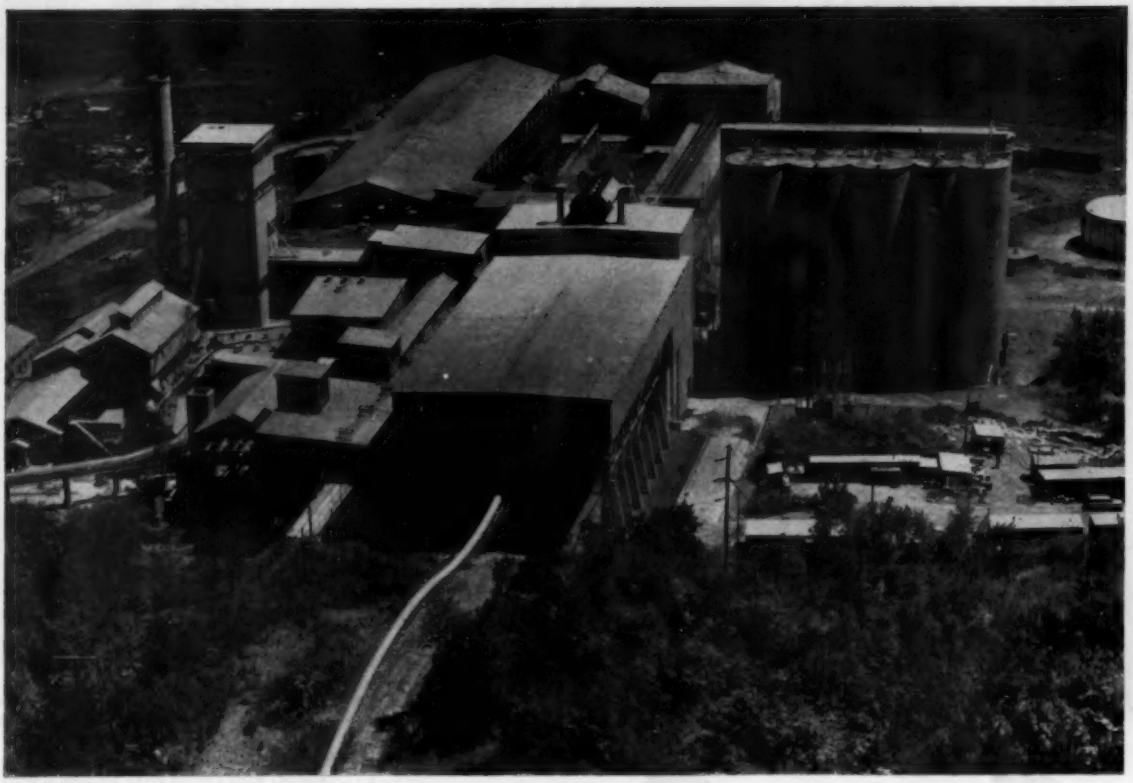
Insurance Policy Held Void

As previously stated in these pages, many persons faithfully pay insurance premiums to insurance companies when in fact the insurance policies are no good, and void. A good motto is: Read your insurance policies, and carefully abide by all clauses. If you fail to do so, you may be surpised, when you have a loss, to learn that your policy is void.

For instance, in *Hartford Accident & Indemnity Company,* 268 S. W. (2d) 419, the testimony showed that a motor truck owner named Blake held an automobile liability insurance policy which stated that Blake's truck was to be used in hauling stone, etc., exclusively for a man named Low and occasional use for "other business purposes".

Rip Van Winkle Slept Here

. . . but we didn't



● Modernizing and enlarging the Catskill plant of the Alpha Portland Cement Company was a challenging job, complicated by the age of the plant (1909), space limitations, the integration of new processing units into established circuits, and power utilization problems.

● The two-year project, costing over $5-million, has increased the plant's capacity by a third or more. Major features include a new kiln with suspension preheater, conversion of the finishing mill, to two-stage grinding, complete renovation of the electrical system, new crushing and screening plants, new conveying and stone storage facilities, an enlarged raw mill building, and a new capacity-doubling raw grinding circuit.

For Design and Construction of your new plant or extension, contact us at any of our offices.

MACDONALD ENGINEERING CO.

Construction Engineers

2349 Yonge Street
Toronto 2, Ontario, Canada

22 West Madison St.
Chicago 2, Illinois

885 Bryant St.
San Francisco 3, Calif.

1956 ...A PEAK-PROFIT YEAR

for Producers scaling with

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OVER 1400 NOW SERVING INDUSTRY

A look at the future doesn't need a crystal ball! Year after year, production-and-cost records show conclusively that SCHAFFER Poidometers handle bulk materials with top speed, precision and economy.

These automatic, durable, easy-to-operate machines give unmatched value in weighing, blending, feeding, mixing, recording and proportioning.

This season . . . any season . . . SCHAFFER Poidometers insure high capacity and product uniformity, *plus* maximum return on every investment dollar.

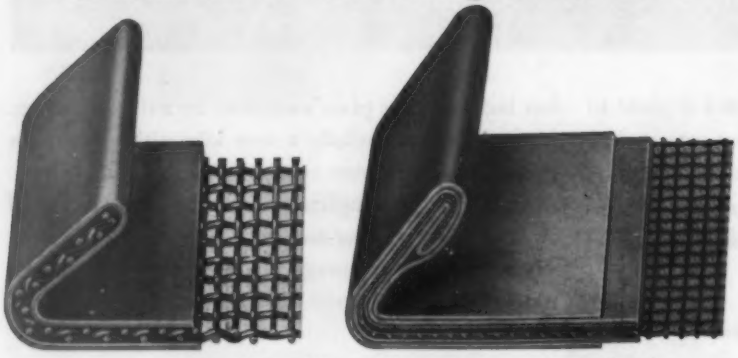
Available with remote control weighing and recording devices, and total weight recorders.

SCHAFFER POIDOMETER COMPANY

2828 Smallman Ave., Pittsburgh 22, Pa.

Write for CATALOG No. 5

Tyler Screen Sections for All Makes of Screening Machines!



Screen sections of Tyler Woven Wire are fabricated for all makes of vibrating screens in any mesh or metal. They are made up with hook-strip or bent-edge construction to suit the machine on which they are to be used.

Tyler hook-strips make possible stretching and maintaining the screening at drum-head tension, which is essential for successful screening and long screen life.

THE W. S. TYLER COMPANY

CLEVELAND 14, OHIO

Manufacturers of Woven Wire Screens and Screening Machinery

Without notifying the insurance company that he had stopped hauling stone for Low, Blake continued to transport stone, etc., for another company. Blake had a bad accident and the lower court held that the insurance company was liable on its policy. The higher court reversed the verdict, saying:

"It is evident that prior to the accident the insured (Blake) was not hauling for Low at all, much less exclusively. Since the restrictive coverage was reasonable and since the use of this truck at the time of the accident did not come within the terms of the policy even if extended to "occasional use", appellant (insurance company) should not have been held liable."

The strange part of the above case is that when Blake stopped hauling for Low, he started to transport stone, sand an gravel for the Gorman Construction Company. And simply because Blake failed to notify the insurance company that he was hauling the same merchandise to a different consignee, the higher court held that he had violated the terms of the insurance policy thereby rendered it void, which relieved the insurance company from it normal obligations.

Sargent Bros. Reorganized As Two Brothers Withdraw

Ernest I. Sargent, chairman of the board of Sargent Bros., Inc., has announced a reorganization of the firm and a change in its corporate name to E. I. Sargent Quarries, Inc.

Quarries owned by the firm are located at Winterset, Peru, Osceola, Decatur, and Davis City in Iowa, and at Blythdale, Mo. The company also holds rights to quarry sites in Iowa, Missouri, and Nebraska.

Mr. Sargent stated that the change in the firm's name and corporate structure was made because his brothers, A. E. Sargent and W. J. Sargent, have withdrawn their interest in the company.

E. I. Sargent will continue as president and chairman of the board of the new concern. His son, R. E. Sargent, has been appointed vice-president and a member of the board. R. E. Frampton will be treasurer, and B. A. Ferguson has become secretary.

Officials of the Lehigh Portland Cement Company have announced tha the firm is planning to spend $145,000 for new facilities at its Buffalo, N. Y., plant. Lehigh spent approximately the same amount at this plant five years ago, chiefly for cement loading bins.

SPECIALLY DESIGNED for rugged conditions like this, Anaconda butyl-insulated Mine Power Cable delivers maximum service and safety.

OPEN PIT OR UNDERGROUND, Anaconda butyl-insulated Mine Power Cable offers exceptional mine water- and abrasion-resistance.

FOR YOUR PROTECTION—

We proved this power cable in our mines

Being miners ourselves, we know mining problems. As both miner and cable manufacturer we're able to do something about them—by *designing* cable to meet problems only miners can know . . . by testing this cable in *our own mines* under actual field conditions.

FOR MINE POWER CABLE

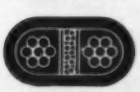
Our firsthand mine experience has helped us build a sturdy cable that cuts down-time. Butyl insulation gives this cable long-aging characteristics, improved resistance to moisture, ozone and heat. Neoprene jacket—rugged, tough—has real flexibility, and resists rock-cutting, impact, flame, sun, and corrosive mine water.

Your Anaconda Distributor has full facts and can help you choose the cable best suited to meet your needs. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y. 65822

*Trade Mark

ANACONDA®
MINE CABLE

FLAT-TWIN CABLE



Improved stranding, new insulation, new grounding wire, and neoprene jacket make this a superior cable for shuttle cars, continuous miners, loaders, drill trucks, cutters.

POWER CABLES

Anaconda Types W & G are rugged, sturdy and long-lived. Used for mine power, shovels, continuous miners, loaders, drill trucks, cutters.

SHOVEL AND DRILL CABLES

Securityflex* Types W and G are used with small shovels, self-propelled drill trucks, pumps and a-c mining equipment. For higher voltages, Type SH cables (shielded) are recommended.

SECURITYFLEX CORDS

Unexcelled for strength, wear resistance and long life. Type SO cords (heavy-duty) provide superior service on remote control and hand drills.

TROLLEY WIRE

FEEDER CABLE BARE OR INSULATED

TELEPHONE WIRE

SHOT-FIRE CORD

WELDING CABLE

"THIS LUBRICANT DOUBLES THE LIFE OF GEARS"

—says TRINITY ALPS LUMBER CO.
Hayfork, California

"Our trucks have a forty mile county road logging haul over adverse grades, each truck making two complete round trips each working day. Our shop foreman in charge of maintenance, reports that with the use of LUBRIPLATE Lubricants there has been a minimum of truck down time and replacements of bearings and gears. The double reduction gears with LUBRIPLATE APG-140 has shown a saving of fifty per cent over previous operations."

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE

LUBRIPLATE LUBRICATION

MAKES CARS AND TRUCKS RUN BETTER AND LAST LONGER

LUBRIPLATE H.D.S. MOTOR OIL . . . THE OIL THAT NEEDS NO ADDITIVES

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

Manufacturers' News

Edward R. Couch has been appointed manager of stationary compressor sales by The Le Roi Division of the Westinghouse Air Brake Co., Milwaukee, Wis. His new duties include planning stationary compressor sales, assisting in promoting a strong distributor sales and service program, and assisting field personnel on special applications.

Prior to joining Le Roi in 1954 as an assistant product sales manager, Mr. Couch was with the Industrial

Edward R. Couch

Paul Azzolina

Products Division of Westinghouse Air Brake Co., which at that time manufactured the stationary compressors now made by Le Roi.

Paul Azzolina has been named manager of the service department for the Le Roi Division. He was formerly assistant manager of the service department.

As manager of the service department Mr. Azzolina will be responsible for supervising field servicing of all Le Roi products, maintaining the parts department, and publication of service bulletins and parts catalogs. He started with Le Roi in 1936 as a catalog clerk, and has held various positions since then, including those of expeditor, order analyst, parts correspondent, service sales correspondent, parts manager, and assistant service manager.

William T. Kelly, Jr., and John S. Hutchins have been elected directors of American Brake Shoe Co., New York, N. Y.

Mr. Kelly, vice-president of Brake Shoe, and president of the Kellogg and Sintermet Divisions, has been with the company since 1928.

Mr. Hutchins, also a vice-president, joined the sales department in 1925. He became president of the Ramapo Division in 1945 and was elected vice-president of Brake Shoe in 1946.

J. D. Harmison is now manager, parts sales, for the Tractor Group, Allis-Chalmers Manufacturing Co., Milwaukee, Wis. He has been tractor sales manager, Farm Equipment Division, since October, 1952.

Prior to coming with the company he was associated with the Allis-Chalmers dealer at Havana, Ill., and was in the automotive parts business in Peoria.

A sales career in the automotive industry which witnessed the great revolution in transportation from the Model T to the over three hundred horsepower, power-steered automobiles of today was honored recently when Edgerly W. Austin, general manager of The Timken Roller Bearing Company's Automotive Division, retired.

Mr. Austin started with The Timken Roller Bearing Co. in 1919. He helped to open the first Detroit office of the company in the Book Building on November 1, 1919. In 1923, when the automotive bearing territory was divided into an Eastern and Western Division, he opened the Timken Company's Cleveland office and became Eastern Division automotive sales manager. In 1926, Mr. Austin returned to Detroit as the assistant general manager of the Automotive Division. In 1928, he was ap-

Edgerly W. Austin

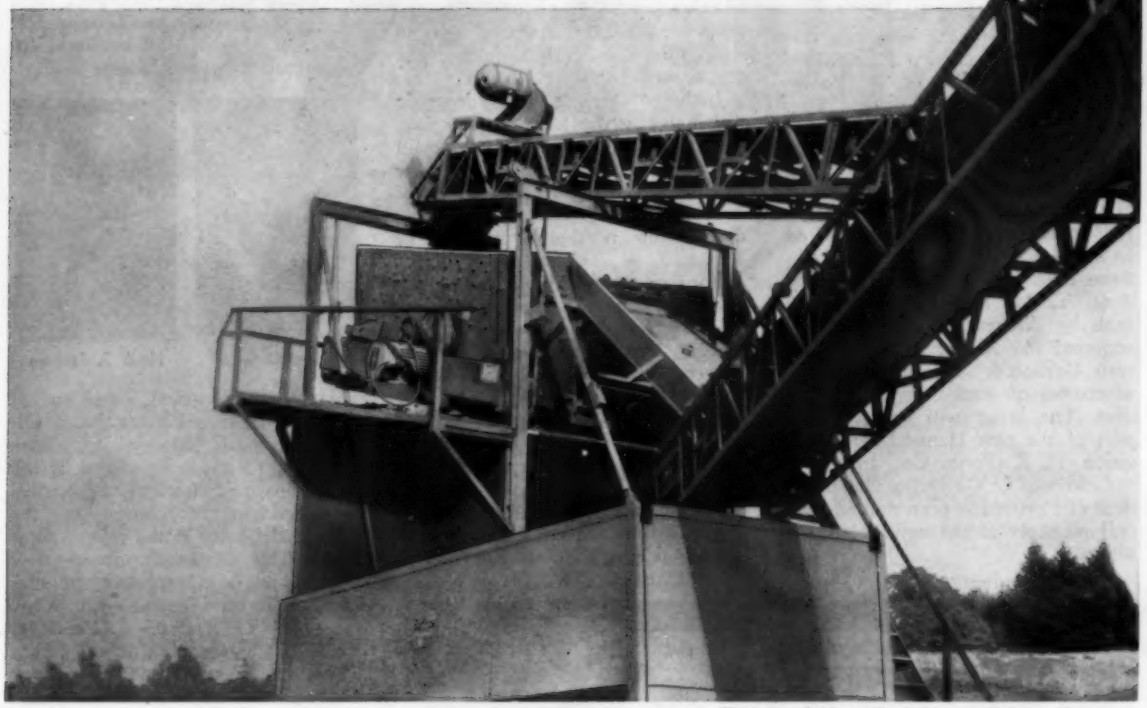
Robert G. Wingerter

pointed to the post of general manager of The Timken Roller Bearing Company's Automotive Division.

Succeeding Mr. Austin to the post of general manager of Automotive Division is Robert G. Wingerter, formerly assistant general manager.

Mr. Wingerter was appointed assistant general manager of the Timken Company's Automotive Division in 1951, at which post he remained until his recent appointment as general manager.

OREGON PRODUCER MEETS STATE SPECS. WITH SECO



Photographed on-the-job near Salem, Oregon

Roy L. Houck & Sons Report Smooth SECO Screens 250 T.P.H. of-2½" Stone

Note in the photograph above a portion of the modern rock crushing plant owned by Roy L. Houck & Sons of Salem, Oregon.

If you were to drive eight miles south of Salem on Highway 99 you could see this model plant. If you live in Oregon, you may be traveling over roads whose fill came from this plant which produces 250 T.P.H. 2½" minus stone for the Oregon State Highway Department.

What do the operators have to say about the workhorse 5' x 14' triple-deck Seco Vibrating Screen which is an integral part of this plant? "Extremely smooth running with very little vibration transmitted to the supporting structure" to quote Roy L. Houck and Sons. What does this mean to you? It means the key to better screening. Seco smooth performance is engineered right into the screen, not only for high tonnages, but for accurate sizing and long, long life.

SEND FOR NEW SECO CATALOG #204 TODAY

SECO

TRUE CIRCULAR ACTION

VIBRATING SCREENS

MAKE 1956 YOUR "LOOK AHEAD" YEAR

Don't let poor equipment rob you of sales and profits! Put your plant in shape for close sizing, high tonnage production with Seco Screens. You'll be set for years and years ahead.

SCREEN EQUIPMENT CO., INC.
Buffalo 25, N. Y.

Baldwin - Lima - Hamilton Corp., Construction Equipment Division, Lima, Ohio, announced the appointment of Krider Equipment Co., Fargo, N. D., as distributor for LIMA shovels, cranes, draglines and pull shovels. The distributorship covers North Dakota as well as three bordering counties in Minnesota.

Also announced is the appointment of J. V. Gunter as district sales manager for LIMA shovels, cranes and draglines in the southern district. He succeeds Fred L. Maus who has joined the R. A. Young distributor organization at Fort Smith, Ark.

The business of Henry Disston & Sons, Inc., has been acquired by H. K. Porter Co., Inc., Pittsburgh, Pa., in exchange for $6,000,000 of its new 4¼% preferred stock, it was announced today by Porter's president, T. M. Evans. At the same time he disclosed that Porter had acquired the Monrovia, Calif. concern, Carlson & Sullivan, Inc., manufacturers of steel rules and measures. The latter will operate as a part of the new Henry Disston Division, H. K. Porter Co., Inc.

Lawrence L. Garber, a vice-president of Porter, has been named general manager of the new Porter division.

Henry M. French has been assigned to the Tampa district of Allis-Chalmers Industries Group as a processing machinery sales representative. He was an application engineer in the processing machinery department from 1946 to 1951, for Allis-Chalmers Manufacturing Co., Milwaukee, Wis.

Manitowoc Engineering Corp., Manitowoc, Wis., announces the appointment of several new dealers to handle the sale of their power crane and shovel line.

Included among new domestic distributors is the J. D. Coggins Co., of Albuquerque, N. M., who will serve the northern counties of New Mexico. Caprock Machinery Co., of Amarillo, Tex., will be the new dealer for northern portions of Texas.

Foreign dealers included in the announcement are Reicco, C. A., Edificio Gran Avenida, Plaza Venezuela, Caracas, Venezuela. The Reicco Co. will be in charge of sales and service of Manitowoc cranes and shovels throughout Venezuela. Manitowoc's announcement also listed a new distributor, the Walter S. Wolff Co., of Stockholm, Sweden, who will handle the sales and service of Manitowoc equipment in the Scandinavian countries.

Hubert C. Smith has been elected vice-president in charge of operations of the eastern division of The Colorado Fuel and Iron Corp., New York, N. Y. He will assume supervision of operations in the eastern division and will make his headquarters at Claymont, Del.

Mr. Smith has had broad experience in the steel industry in metallurgy, product development and quality control, and was former vice-president, quality and research, for the Great Lakes Steel Corp.

Hubert C. Smith

Hugh S. Ferguson

Hugh S. Ferguson, president of Dewey and Almy Chemical Co., Division of W. R. Grace & Co., New York, N. Y., has been named by the Grace board of directors as executive vice-president in charge of the Chemical Group in the parent company. The Chemical Group now headed by Mr. Ferguson includes four divisions—Dewey and Almy Chemical Co., Davison Chemical Co., Grace Chemical Co., and Grace Chemical Research and Development Co. Until this appointment, responsibility for directing Grace chemical activities was exercised by chairman of the board Charles E. Wilson. Mr. Ferguson will continue for the time being as president of Dewey and Almy.

At the same time the board announced the promotion of six other officers to wider responsibilities and the election of Alexander T. Daignault as an executive vice-president and chief financial officer of the international chemical, trading and financial concern.

The Lincoln Electric Co., Cleveland, Ohio, has announced the opening of a new branch office and warehouse at 1224 Walnut St., in Denver, Colo. District manager for the Denver area will be Merrill F. Yale, who has been a sales engineer in Lincoln's San Francisco office since 1949.

Ray Zeh has been made district manager for the company in Chicago. For the last four years, he has been district manager in Syracuse.

Kleenslot
WEDGE WIRE
PREPARATION SCREENS

On October 6, 1952 these Wedge Wire panels, as shown, were installed on a 6 x 16 Allis Chalmers low head vibrator. On April 30, 1955, after 7,836 hours of service they had processed 1,175,400 tons of 5" x ⅜" coal, 1.36 float material. These screens are still in service and are proof positive of the long life of KLEENSLOT Wedge Wire Screens.

The illustration directly above shows the location of the test screen that was removed for checking. The dotted lines on the diagram show the point where the rinse water from two different rinse boxes hit the screens. Send for our completely illustrated catalog today.

Wedge-Wire
CORPORATION
GAS STREET AT NICKLE PLATE R. R., WELLINGTON, OHIO

There's only one

GYRO-FLO

Ingersoll-Rand's Portable Rotary Compressor

INTRODUCED IN 1950

In 1950 the Gyro-Flo was absolutely new—a bold, forward, original idea in portable compressors. There was no other portable compressor like it.

Now, years of successful performance of thousands of units in all four sizes has established GYRO-FLO as the standard in portable compressors. This is affirmed by the ever-growing trend to rotary design.

Here there is no substitute for experience. Maintenance costs cannot be measured by one year's operation—or even two or three years'. Each size must pass the test of time on the job. That's what GYRO-FLO has been doing since 1950. During this time all new, necessary features have been added so that GYRO-FLO is the best established rotary portable compressor now available.

When you purchase GYRO-FLO air power, you get today's most economical portable compressor. There is only one GYRO-FLO – and Ingersoll-Rand has made it since 1950.

Ingersoll-Rand, 11 Broadway, New York 4, New York

AVAILABLE IN FOUR SIZES

125 *cfm*
210 *cfm*
315 *cfm*
600 *cfm*

2-294

Announcement has been made that The Raymond Bag Co., of Middletown, Ohio will operate as a wholly owned subsidiary of The Albemarle Paper Manufacturing Co., of Richmond, Va. Raymond, manufacturers of Multiwall Paper Shipping Sacks, will retain its identity and the present personnel will remain intact.

Raymond was originally organized in 1896 and for forty years has been one of the larger industries in Middletown. The company has ample manufacturing facilities for producing all types of Multiwall Paper Shipping Sacks which are used for the bulk packaging of more than four hundred different products.

Baldwin Supply Co., Charleston, W. Va., was recently appointed an authorized Carboloy carbide distributor by Carboloy Department of General Electric Co., Detroit, Mich.

The newly appointed organization, which makes its headquarters at 207 Virginia St., W., will handle Carboloy's standard line of tools and blanks, special tools and blanks, diamond wheel dressers and masonry drills.

John W. Becker, a sales representative in the Syracuse district of Allis-Chalmers Industries Group since 1951, has been named manager of the district. He has been with Allis-Chalmers since his graduation in 1948 as an electrical engineer from the University of Nebraska. At Syracuse he succeeds A. J. Mestier, Jr., recently named manager of the Detroit district.

The new engineering building of the Fuller Co., Catasauqua, Pa., has been completed and occupied. Located near the company's main plant and office, the new building houses 157 engineering personnel who have previously been located at seven different places in Catasauqua.

The new building is a modern one-story, concrete-block structure with precast roof and trim. Twenty-three continuous rows of fluorescent lights illuminate the engineering and drafting area of the building. A parking area is located adjacent to the structure. Construction of the new building was one of the first important steps taken by Fuller following its acquisition by General American Transportation Corp. in August, 1954.

STOP!
TOO FREQUENT SHUTDOWNS
Buy WIRE SCREENS THAT
SERVE LONGER — STAY STRONGER
CLEVELAND
WIRE SCREENS
... maintain rigid accuracy of openings.
... provide longer productive service.
... are accurately woven of tough, yet ductile abrasion-resistant steel.
... increase your profits.
Send us your job requirements — our specialists are at your service.
THE CLEVELAND WIRE CLOTH & MFG. CO.
3576 E. 79 STREET · CLEVELAND 5, OHIO

The election of Thomas S. Nichols, president of Olin Mathieson Chemical Corp., as a director of Fruehauf Trailer Co., Detroit, Mich., has been announced by Roy Fruehauf, company president.

In electing Mr. Nichols to the board, the Fruehauf Directors approved a change in the company by-laws which increased the board membership from 15 to 16 members.

Mr. Nichols was named president of Olin Mathieson Chemical Corp., in September, 1954 at the time of the merger of Olin Industries and Mathieson Chemical Corp. He had previously been president and chairman of Mathieson Chemical Corp.

Thomas S. Nichols

Frank A. Grooss

Frank A. Grooss has been appointed an assistant to vice-president G. E. Burks, who has administrative responsibility for the Engineering and Research departments at Caterpillar Tractor Co., Peoria, Ill.

A specialist in the development of wheel tractors, motor graders and scrapers, Mr. Grooss was formerly assistant chief engineer at the company's new plant in Decatur, Ill. He joined Caterpillar in 1941 and participated in the College Graduate Training program. After completing the course he gained experience in the field research laboratory, the vehicle and equipment laboratory and in the field. He joined the engineering department in 1948 and received his Decatur appointment last December.

Mr. Grooss has been succeeded by A. W. Sieving, formerly general supervisor of Decatur engineering.

The importance of the Canadian market to Cumins Engine Co., Inc., Columbus, Ind., has been emphasized with the appointment of a regional manager for eastern Canada with headquarters at Toronto, Ont.

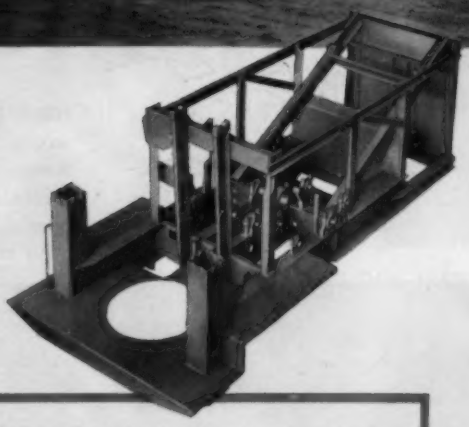
Peter Ster, Jr., will serve as direct factory liasion man in the Provinces of Ontario, Quebec, New Brunswick, Nova Scotia, Newfoundland and Labrador. He joined the Cummins organization in 1951 as a field representative.

Keep Preparation Costs at Rock-Bottom

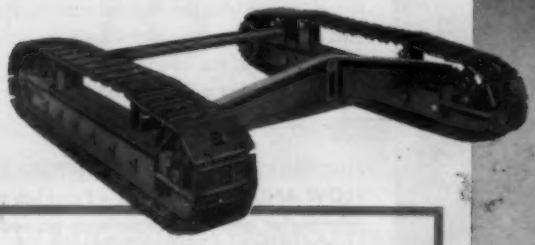
Because economical preparation of rock is not just a matter of speed, it pays to take a close look at the other factors which determine overall operating costs of your drilling equipment—items like purchase price, maintenance, depreciation, bit life. On all these points you'll find Bucyrus-Erie cable tool blast hole drills are hard to equal.

They can put down hole in the toughest formations. Drilling speed, length of stroke, and tool weight are all coordinated to provide a concentration of maximum energy where it counts most—at the bottom of the hole. They're built to stand up under toughest drilling conditions, too, with their long wide crawler mounting, shock-resistant drill frame, rigid well-braced derrick, and quality construction throughout.

For detailed information, write for a free copy of these 24-page illustrated bulletins: 50-T, for 9- to 12-in. holes; 29-T, for 6- to 9-in. holes; 27-T for 6- to 6⅝-in. holes; and 22-T, for 5⅝- to 6⅝-in. holes. 25855C



All-steel welded drill frame forms a shock resistant box for drilling machinery . . . has ample strength and rigidity to withstand shocks and stresses of tough drilling.



Based on Bucyrus-Erie's long experience in the design of crawler traction for excavators, this mounting gives solid support to the drill frame . . . requires little maintenance even after many years of service.

Tubular bracing ties derrick to drill frame, and resists twisting and bending forces created by carrying heavy tool strings. With the sharp hit-and-snap-up action provided by derrick head shock absorber, each drilling blow effectively shatters toughest rock.

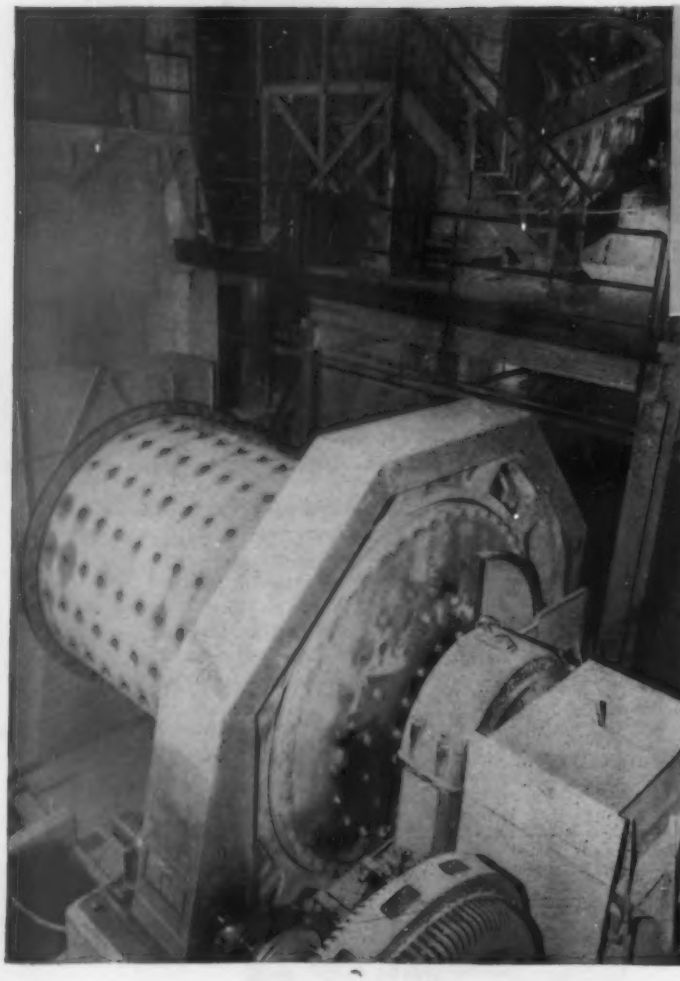
BUCYRUS ERIE

South Milwaukee Wisconsin

75 YEARS OF SERVICE to Men Who Shape the Earth

Here's How INDUSTRY'S TOP TECHNICAL Helps Grinding Mill Operators

HELPS PLANT AND CONSULTING ENGINEERS — Here's the way it works. Let's suppose you are building a new concentrator and you want information and recommendations on crushing, grinding, screening, process flow and equipment needed. Allis-Chalmers specialists, familiar with the process problems involved, work with your engineers to provide a solution.



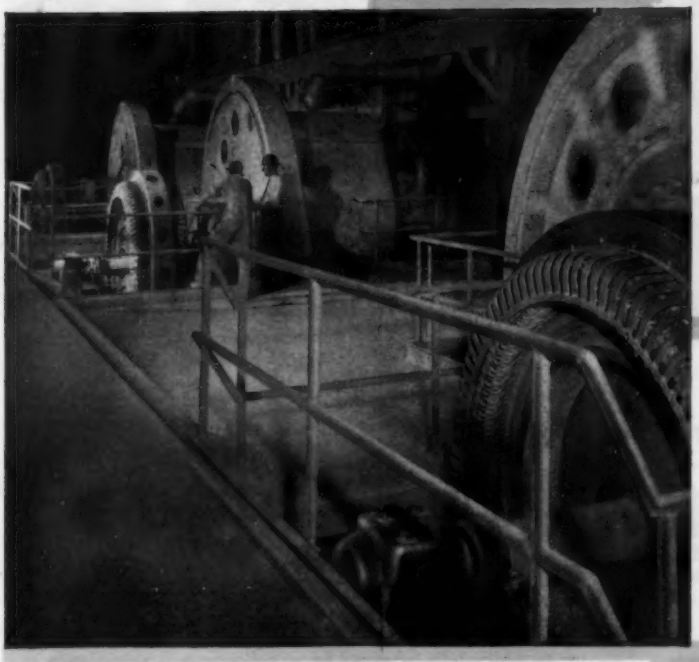
TESTS ORE SAMPLES — Ore samples are sent to the A-C laboratory for crushing, grinding, screening and additional tests to determine the equipment and process best suited to produce the desired end product. This laboratory is one of the best-equipped, best-staffed in the country. View of a section of the pilot grinding mill is shown.

FURNISHES INFORMATION ON PROCESS FLOW AND EQUIPMENT — From lab test information and wide experience gained in solving similar problems, a flow sheet and a list of needed equipment are worked out. In the plant shown here, Allis-Chalmers recommended and furnished the rod and ball mills.

ALLIS-

TEAM

ALLIS-CHALMERS
PROGRESS IN
Grinding Mills



PROVIDES CONTINUOUS SERVICE—When maintenance is necessary, a telephone call will put another A-C team to work on your problem. Complete records are kept on every Allis-Chalmers grinding mill. If parts are needed, these records are checked, and *exact* duplicate parts are speeded to you. Your nearest A-C District Office is always ready to help you. One section of the tremendous inventory of parts stocked at A-C is shown in this photo.

A COMPLETE PLANT OR A SINGLE MACHINE—Because Allis-Chalmers builds many types of equipment . . . crushers, grinding mills, screens, washers, kilns, coolers as well as the electrical power generating equipment, motors and controls, they can furnish a whole plant or a single machine. Allis-Chalmers offers the advantage of undivided responsibility for the complete process and equipment package.

AN ALLIS-CHALMERS TECHNICAL TEAM is always ready to work with your plant or consulting engineers on your grinding or processing problems. To take advantage of their services, call your nearest Allis-Chalmers District Office, or write Allis-Chalmers, Milwaukee 1, Wisconsin. A-4292

ALLIS-CHALMERS EQUIPMENT FOR THE MINING AND ROCK PRODUCT INDUSTRIES

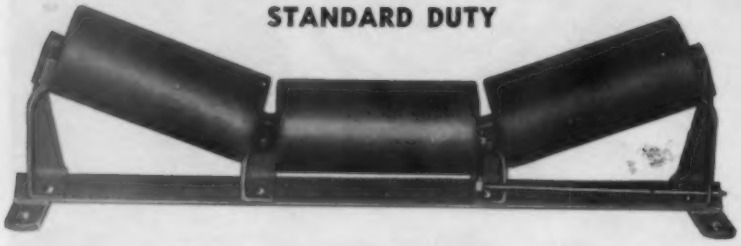
Crushers, all types — Vibrating screens, all types — Kilns — Coolers — Washers — Dryers — Smelting equipment

CHALMERS

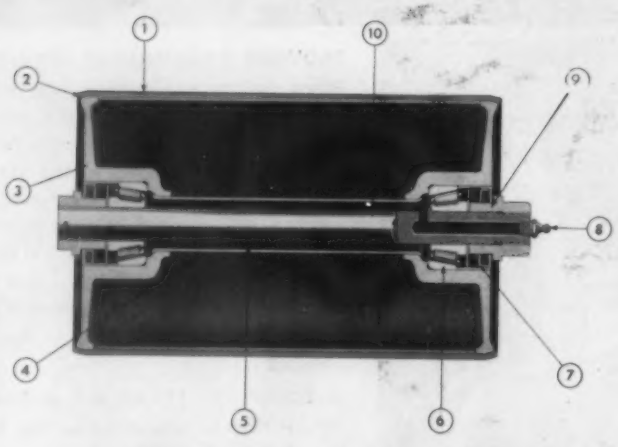
A-C ALLIS-CHALMERS

WEBSTER TYPE 32
Roller Bearing Belt Conveyor Idlers

STANDARD DUTY



Webster Belt Conveyor Idlers are quality-designed to give you long service with the lowest possible power and maintenance requirements — perfect and permanent roll alignment — self-cleaning steel base — clamped-in rolls — easy removal of rolls as a unit — slotted holes in base to facilitate erection and permit alignment on conveyor frame.



CHECK THESE IMPORTANT FEATURES

(1) Balanced tubular steel roll, furnished in 6" or 5" diameter.

(2) Rounded edges provide positive lock for malleable ends and protect the belt.

(3) Malleable iron ends keep bearings in perfect alignment and readily deflect dust and dirt from the bearings.

(4) Strong steel tube adds strength.

(5) Inner grease reservoir is provided by the steel tube.

(6) Timken tapered roller bearings with hardened inner and outer races. Life-Seal bearings can be furnished.

(7) Labyrinth metal and felt grease seal. When handling fine, abrasive materials, all-metal seal is furnished.

(8) One side hydraulic lubrication.

(9) Malleable iron closure assures proper bearing clearances by means of adjusting nut.

(10) Accurately machined roll shaft is of ample size.

WEBSTER MFG., INC.
TIFFIN, OHIO
Offices in Principal Cities

David W. Armstrong has been appointed manager of the new Kansas City, Mo., district sales office of the Fuller Co., Catasauqua, Pa. The new office will operate as a sub-office of the Chicago office, which is one of the five national branch offices of the Fuller Co., a subsidiary of the General American Transportation Corp.

Mr. Armstrong moves to his new position of manager at Kansas City from Chicago which has been his headquarters since 1951. In his new post, he will report direct to Philip M. Klein, manager of the Chicago branch office. He joined the Fuller Co. in 1949, and worked in various capacities at Catasauqua, Pa., until 1951 when he was transferred to the Chicago office.

D. W. Armstrong

Ellsworth B. Doelp

Ellsworth B. Doelp has been named district manager of the central territory for Hardinge Co., Inc., York, Pa., with headquarters at 205 W. Wacker Drive, Chicago. He is in charge of all sales of Hardinge process equipment for mining, chemical, mineral, water and industrial wastes applications in Illinois, Indiana, Missouri, Arkansas, Oklahoma, Kansas, Nebraska, Iowa and portions of Texas, Wisconsin, Michigan and Kentucky.

Mr. Doelp spent three years with York Ice Machinery Corp. as a design engineer, and three years as production foreman of the Pennsylvania Alcohol Co. before joining Hardinge Co. Inc., in 1936.

Fruehauf Trailer Co., and Hobbs Manufacturing Co., of Texas in a joint statement announced that the truck-trailer manufacturing facilities of the Hobbs Co. have been acquired by Fruehauf Trailer Co.

The acquired manufacturing facilities will be operated as Fruehauf-Hobbs of Texas, a Division of Fruehaulf Trailer Co. Fruehauf trailers, built in Texas, will carry the nameplates "Fruehauf-Hobbs." William E. Grace, who for 21 years has been vice-president and general manager of Hobbs, continues in charge of the Fruehauf Texas operations.

EATON FEATURES reduce hauling costs, keep trucks on the job

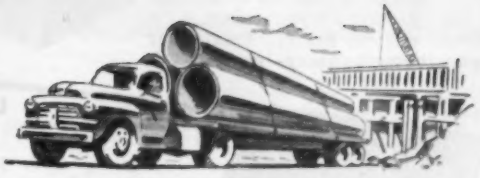
PLANETARY GEAR DESIGN—
distributes pressure and wear over four planetary gears, resulting in lower unit stress, reduced maintenance, longer axle life.

FORCED-FLOW LUBRICATING SYSTEM—
supplies positive lubrication to all moving axle parts, even at slowest vehicle speeds.

POSITIVE SHIFT CONTROL—
provides quick, easy shifts. Drivers use available gear ratios—the right ratio for road and load conditions.

SELF-CONTAINED AIR BRAKE—
provides for greater braking efficiency; quicker action, quicker release; quick, easy reline. Available on Eaton air brake models.

EXTRA-RUGGED CONSTRUCTION—
eliminates the possibility of harmful distortion or misalignment under full load, holds maintenance to a minimum.



More than Two Million
Eaton Axles in Trucks Today!
Ask your truck dealer
for complete information.

EATON 2-SPEED AXLES

EATON

AXLE DIVISION

MANUFACTURING COMPANY
CLEVELAND, OHIO

PRODUCTS: Sodium Cooled, Poppet, and Free Valves. Tappets. Hydraulic Valve Lifters. Valve Seat Inserts. Jet Engine Parts. Rotor Pumps. Motor Truck Axles. Permanent Mold Gray Iron Castings. Heater Defroster Units. Snap Rings Springtites. Spring Washers. Cold Drawn Steel. Stampings. Leaf and Coil Springs. Dynamatic Drives, Brakes, Dynamometers

Recognizing the need that exists throughout the country for an ever increasing supply of technically trained engineers, the Gardner-Denver Co., of Quincy, Ill., is taking an active part in the furtherance of education of deserving students. As a result, the Board of Directors of the Gardner-Denver Co. has announced the establishment of a generous engineering scholarship fund that is part of the Gardner-Denver foundation.

Scholarship grants are given to schools which are leaders in their specific fields. The student selection for scholarship grants is made by the schools on the basis of their requirements jointly agreed to by the Gardner-Denver Co. and the schools involved.

Leonard T. Harris, sales and service engineer at Kensington Steel Co., Chicago, Ill., since 1947, has been appointed assistant sales manager in the company's Chicago office.

Associated with Kensington since 1943, when he joined the company as design and development engineer, Mr. Harris has had 38 years of experience in engineering and design of manganese steel castings.

Jack H. How, president of Western Machinery Co., San Francisco, Calif., announces that the following executive appointments have been made: H. J. Mayer, executive vice-president; C. F. Skinner, general manager of manufacturing, engineering and construction; R. B. Utt, chief executive engineer; W. H. Newton, general sales manager for WEMCO products and Western Knapp Engineering services.

H. J. Mayer, new executive vice-president, has been with Western Machinery Co. for 20 years and has been instrumental in its growth.

Derek S. Brown

Derek S. Brown has been named director of personnel for Napco Industries, Inc., Minneapolis, Minn. He was for several years with the Stineway-Ford - Hopkins retail drug chain in Chicago as personnel director. Prior to that he was associated with the Howard Foundry, also in Chicago.

Mr. Brown joined Napco in September, 1955. In his new position he will be responsible for all personnel functions of Napco's five divisions.

G. O. Britton has been appointed to the position of manager of distributor sales by American Hoist & Derrick Co., St. Paul, Minn. He will be responsible for sales of the company's line of crawler and truck mounted cranes and excavators, as well as hoists and derricks.

Mr. Britton has a broad background in the construction and other allied fields. Prior to his connection with American Hoist he was general sales manager of the Schield Bantam Co., starting there in 1949 after leaving the position of domestic sales manager of Athey Products Co., manufacturers of heavy earth moving equipment sold through Caterpillar dealers.

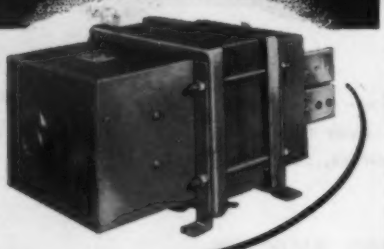
Joy Manufacturing Co., Pittsburgh, Pa., announces the relocation of its Detroit office to 17615 W. McNichols Rd., Detroit, Mich. Stephen Laskevich, Jr., is the company's representative in that area.

Also announced is the appointment of J. E. Douglas as district sales manager of the El Paso territory. He succeeds E. E. Miller who has retired after 43 years of service.

LET THE RECORDS SPEAK!

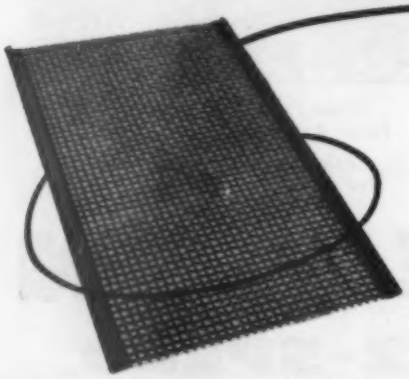
HANCO SCREEN HEATERS

ELIMINATE *Costly* SCREEN BLINDNESS



FASTER, MORE ACCURATE SIZING

HANCO electric heaters are engineered to meet top capacity requirements for heating **all** metallic screen cloth. Mechanical abuse such as "beating" or brushing can be **eliminated completely** when you install a HANCO electric heater. Treat your screens the modern way – get HANCO.



Available in five different assemblies. HANCO engineers have designed and constructed electrical screen heaters to fit YOUR make of screen. Note: Reduction in openings can be effected to meet ever changing specifications.

LOOK AT THESE FEATURES

Faster screening—faster processing means fewer "returns".

Elimination of mechanical abuse to keep screens open.

Longer screen life — no manual cleaning increases screen life up to 800%.

Fewer shut downs for replacement of worn screens.

HANCO quick change assemblies assure easy cloth changes.

Low maintenance cost. HANCO heaters are designed for heavy-duty service.

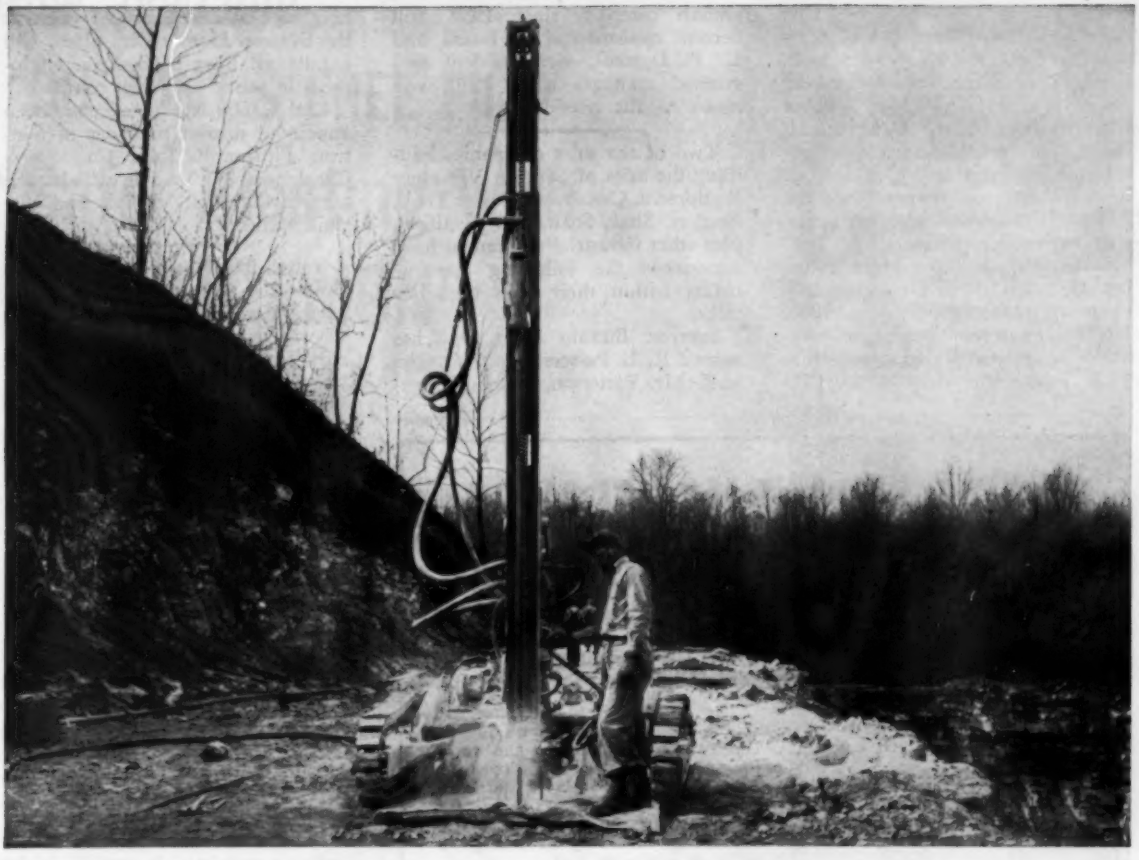
Hanco

SEND FOR OUR COMPLETE BULLETIN

F. R. HANNON & SONS

1605 Waynesburg Rd. S.E., Canton 7, Ohio

PIONEERS IN ELECTRIC SCREEN HEATING — FIRST IN THE FIELD OF LOW VOLTAGE AND HIGH AMPERAGE SCREEN HEATING



It's new! Gardner-Denver "Air Trac"® Drill
a self-propelled drilling rig with heavy-duty drill

The Economical Answer to Deep Hole Percussion Drilling in Pits, Quarries and Surface Rock Cuts

Spots accurate holes . . . drills fast . . . on steep hillsides or rough or rocky ground.

Air Trac crawlers have full-traction shoes — each track self-propelled through double-chain drive by its own Gardner-Denver high-torque, five-cylinder radial air motor.

Self-equalizing, self-stabilizing column arm supports Gardner-Denver chain feed drilling mast. Rugged chain feed powered by a high-torque, five-cylinder radial air motor.

Two Air Trac models — one equipped with powerful DH123 (4½") drill — one with the smaller DH99 (4") drill. Furnished with high-quality Gardner-Denver Ring Seal Shanks and Gardner-Denver Sectional Drill Rod equipment for efficient, low-cost deep hole drilling. Send for full specifications.

GARDNER-DENVER

GARDNER-DENVER Since 1859

KELLER TOOLS

"AIR TRAC" PATENT PENDING

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Ave., Toronto 16, Ontario

The Thor Power Tool Co., Aurora, Ill., manufacturers of portable air and electric power tools, has announced the acquisition of the assets of the Cincinnati Rubber Manufacturing Co., Cincinnati, Ohio. This company manufactures transmission and conveyor belting, hose, rubber roll covers, packings, gaskets, tubing and associated mechanical rubber products.

Cincinnati Rubber Manufacturing Co., has been producing mechanical rubber goods since 1905. No changes in management or operations are contemplated, except that J. F. Joseph, president of the Cincinnati company since 1934, will become chairman of the board, and L. P. Darnall, vice-president and general manager since 1946, will move to the presidency.

Two of the sales companies handling the sales of Syntron Vibratory Equipment, Conveyors, Power Tools, Feeders, Shaft Seals, and Rectifiers, plus other industrial equipment have announced the following appointments within their sales organizations.

Syntron Buffalo Sales Co., has named R. L. Patterson to their sales staff. Mr. Patterson, formerly manager of Gasoline Hammer Sales at the Syntron Homer City plant, will handle all lines of Syntron equipment in four New York counties.

Earl K. Gardner has recently been appointed district manager of Syntron Pittsburgh Sales Co., South Charleston, W. Va. He will handle sales in the West Virginia and Virginia territory.

Robert Dankert is a recent addition to the sales force of Lippmann Engineering Works, Milwaukee, Wis. He will represent Lippmann in New York State, the New England States and the western two thirds of Pennsylvania in the promotion and sale of Lippmann crushing, screening and conveying machinery for the pit, quarry, cement and mining industries.

Distributorships in the New England area are currently being arranged. Any established New England dealers interested in handling Lippmann crushers, screens, conveyors, etc. are invited to contact the factory at 4603 W. Mitchell St., Milwaukee 14, Wis. for possible openings in their territory.

Dorr-Oliver Inc., Stamford, Conn., announces the promotion of Carlton W. Crumb to the new post of director of technical data and Charles M. Comstock to the position of advertising manager. A veteran of 28 years service with the present Dorr-Oliver organization, Mr. Crumb was formerly sales promotion manager while Mr. Comstock served as assistant sales promotion manager.

A. Siegel has been promoted to eastern division sales manager of Bags and Paper for the Southern Kraft Division of International Paper Co., New York, N. Y. He joined International Paper in 1925 at the company's New York offices. Since 1935 he has served as assistant sales manager of the Southern Kraft Division in charge of all paper products.

Hugh B. Vergara has been named to replace Mr. Siegel as assistant sales manager. He has been with the company since 1935 in different sales positions in the New York office.

Donald E. Stoops has been appointed manager of distributor sales for Clark Equipment Company's Transmission Division, Jackson, Mich. He will be in charge of dealer and distributor sales activities for Clark's line of transmissions and torque converters and will continue to supervise the advertising and merchandising program.

PROVEN RUGGEDNESS
for toughest crushing
Year in and year out you find more Farrel-Bacon crushers in really severe service than any other make on the market. When you examine these machines, you understand why.
The answer lies in the extremely simple mechanism and extra rugged construction of both frame and working parts. Also, Farrel-Bacon crushers, even after many years of the most abusive service, can always be brought back into first class condition, by rebabbitting, rebushing or truing up parts—at minimum cost.
Because they last so long, investment cost per year is exceptionally low.
Sizes: 60" x 48" to 10" x 7". Write for complete information or engineering assistance
FARREL-BACON
Ansonia, Conn.
BA-7

Now available—

DU PONT'S FREE FILM "Safer Blasting with 'NITRAMON' and 'NITRAMEX'"

Dramatic film demonstrates greater safety of Du Pont's Blasting Agent line

Here is a new color film offering visual proof that "Nitramon" and "Nitramex" are the safest blasting agents ever made. In a series of dramatic tests, the superior safety characteristics of these insensitive blasting agents are demonstrated.

They cannot be detonated by heat, impact, friction, shock, or the strongest blasting caps. As the film shows, a special "Nitramon" Primer—itself relatively insensitive—does the job with maximum safety.

How to use the Du Pont team

Also presented, in step-by-step fashion, is the method of using "Nitramon" and "Nitramex" with maximum safety and blasting effectiveness. Schematic drawings and diagrams are included.

This film—intended to promote safer, more efficient blasting—is available for safety meetings at no cost. Simply contact your Du Pont Explosives representative or write on company letterhead to the branch office nearest you, or to E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

SAWING CAUSES FRICTION, but has no effect on "Nitramon." Blasting agent also refused to detonate in presence of other exploding materials under test conditions.

BURNED AT THE STAKE in a wood-and-gasoline fire, "Nitramon" does not explode, but merely decomposes without danger. High temperatures cannot detonate it.

RIDDLED BY BULLETS from .30 caliber rifles, "Nitramon" demonstrates insensitivity to impact. A large blasting cap also failed to cause detonation.

DU PONT

BLASTING AGENTS

Products of Du Pont Research

DU PONT

REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING... *THROUGH CHEMISTRY*

SEE SPECIAL SCREENINGS OF FILM

"Safer Blasting with 'Nitramon' and 'Nitramex'"

at

NATIONAL CRUSHED STONE ASSOCIATION CONVENTION

BOOTH 13 . . . CONRAD HILTON HOTEL . . . CHICAGO

FEBRUARY 20, 21, 22

Modernized Alpha Plant

(*From page* 102)

supplying the four tube mill feed boxes. A Fuller variable-speed rotary feeder below each feed box furnishes a regulated amount of material to the Jeffrey vibrating conveyors which transport it to the four finish mills. The latter were formerly compartment mills—one an Allis-Chalmers 7- by 24-ft. unit and the other three, of Bethlehem Foundry manufacture with 7- by 26-ft. dimensions. They have been converted to straight tube mills and are using grinding balls 1¼ in., and smaller in diameter.

Finish-mill product is normally conveyed to a battery of four Gayco 14-ft. separators through two screw conveyors, although provision has been made for operation of the mills exclusively of the separators. Each separator is fed through a Fuller roll feeder from the common screw conveyer, and rejects from the separator can either be returned to the tube mills in a closed circuit or put into bins for future feed.

The conveying system in the finish-grinding operation has been redesigned to accommodate 250 bbl. per hour. Full potential of the rehabilitation of this department has not yet been realized, owing to the fact that full conversion of mills and flow is still in the final stage.

A new Fuller-Kinyon pumping system was installed to handle the increased grinding capacity. It will transfer 300 bbl. per hour of finished product (97 percent minus 200-mesh material) from the four separators to the 193,000 bbl.-capacity finished-material storage silos. These silos are grouped in three lines of five each, and below each line there is a cement pump. Any two pumps can be operated at one time to supply the packing house, while the other is utilized in bulk loading. A battery of four St. Regis packers is used for bagging the finished cement.

With about 165 men in the operating crew, daily production resulting from the expansion and revisions now approximates 3,600 bbl., whereas before the program was put into effect, the same crew produced about 2,700 bbl. per day. Full interlocking of operating controls throughout the various departments is very nearly completed. The new raw mill is already operated with a system that precludes out-of-sequence starting of equipment. G-E controls and Westinghouse motors are used almost exclusively.

The greater part of the over-all enlargement and rehabilitation project, including the rearrangement and design of the power distribution system, was designed by the MacDonald Engineering Company of Chicago, to specifications developed by the Alpha Portland Cement Company engineering staff under the supervision of Howard Hanks, vice-president. Preheater design and erection supervision was furnished by the Fuller Company of Catasauqua, Pa. In addition to the engineering staff, R. T. Recknagel, plant superintendent, and J. Compton, assistant superintendent, were directly concerned with the supervision and co-ordination of the various phases of the project, and successfully met the problem of maintaining production in the face of the complexities involved in such an extensive expansion.

Now Available!

NEWEST

PORTLAND CEMENT

PLANT MAP

We are pleased to announce that our new Portland Cement Plant Map is ready for distribution. This map shows the locations of all the portland cement plants and distributors now operating in the United States, Canada, Mexico, Alaska, Hawaii, and Cuba, plus those that will be completed in 1956. These plants are listed alphabetically, by state and city, so they can be located easily. Production capacity in barrels, types of process, and brand names of each firm's products are also shown.

In order to avoid confusion, distributing plants are listed separately at the bottom of the list. Distributors are also listed alphabetically by state and city.

The map is 34 by 40 inches and is printed in black and white on heavy, durable 60-lb. paper stock. Prices are as follows:

1-10 maps	**$1.00 each**
11-25 maps	**$ .75 each**
more than 25 maps	**$ .50 each**

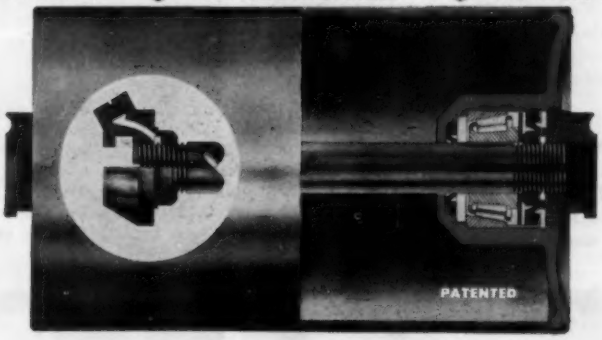
Previous editions of similar maps were received with such great enthusiasm that our supply was soon exhausted. Therefore, we suggest that you order your maps now, so that you will be sure you will get as many copies as you order.

Please make your request for these maps on your company letterhead. Also, send along a check, cash or money order to cover the number of maps you wish to purchase.

WILLIAM JACKSON, operations manager of the Glacier Sand and Gravel Company, San Francisco, Calif., was appointed vice-president and general manager of the company, according to Wallace A. Marsh, vice-president and general manager of Permanente Cement Company.

You Need... CONTINENTAL'S UST Idlers

CGC UNIT-SEALED CGC PRE-LUBRICATED CGC TIMKEN BEARINGS



Saves Grease!
Saves Labor!
Saves Belts!
Long Life- THE ULTIMATE IN MINIMUM MAINTENANCE

Continental's Unit-Sealed "UST" Conveyor Idlers, incorporating Timken Bearings, Garlock Klozures, are the answer to the operator's prayer.

The Unit Bearing Assemblies—"sealed unto themselves" provide an ample but not excessive grease reservoir. This represents a saving of grease and further eliminates any possible migration of the grease from upper to lower bearings on inclined rolls. The lubricant is a top quality water repellant grease of a stable consistency with a wide temperature range for long life.

Most important—this construction permits operating the Continental "UST" Idler for extended periods of time without relubrication for 1-2-3 years or longer depending upon the severity or character of conditions.

For detailed information on these idlers write for Bulletin PO-116

CG-5209

INDUSTRIAL DIVISION
CONTINENTAL GIN COMPANY
BIRMINGHAM, ALABAMA

ENGINEERS CGC ATLANTA • DALLAS • KNOXVILLE • MEMPHIS CGC MANUFACTURERS
NEW YORK 17, NEW YORK

Tuffy® Tips

Here Are Some Of The Steps Taken To Pre-Determine Tuffy Toughness And Assure Longer Rope Life

1. Metallographic Examination. Under powerful magnification, Union Wire metallurgists examine the microstructure of the steel in rods and wires to see that rigid specifications are met and maintained in processing.

2. Chemical Analysis Laboratory. Steel for Union Wire Rope is made to rigid specifications. Here rods and wire are chemically analyzed to make certain that the correct combinations of carbon, manganese, etc., are kept under control.

3. Designed by Union Wire Rope Engineers. This accelerated fatigue tester is equipped with sheaves from 8" to 24" permitting application of any bending stress. Tensile loads up to 12,000 lbs. are applied. Thus wire rope life under toughest fatigue conditions is pre-determined.

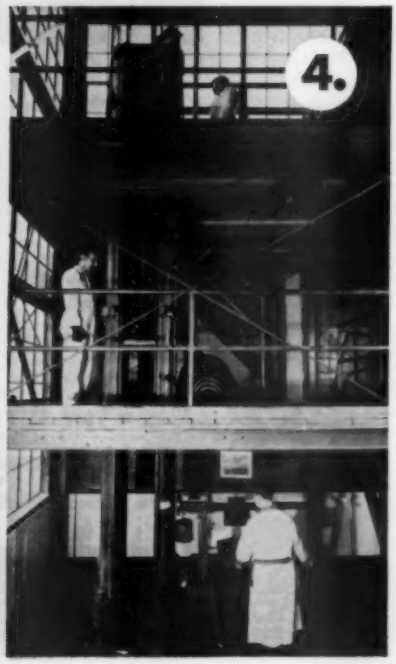
4. Rope Testing Machine. This 3-story high machine is designed to test and record the breaking strength of the rope when finished and ready for the customer.

5. Static Flexibility Tester. The demand of machinery engineers toward smaller sheaves and higher speed made it necessary for Union Wire Rope Engineers to adapt this standard machine in order to test static flexibility.

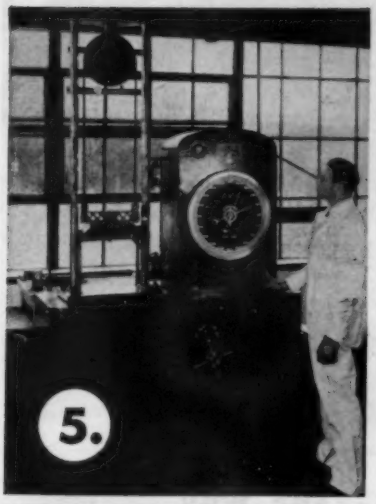
6. Wire Tensile & Torsion Tester. In tension and under torsion, this machine tests wires to see that they measure up to the extraordinary high level of strength and toughness mandatory in Union Wire Rope.

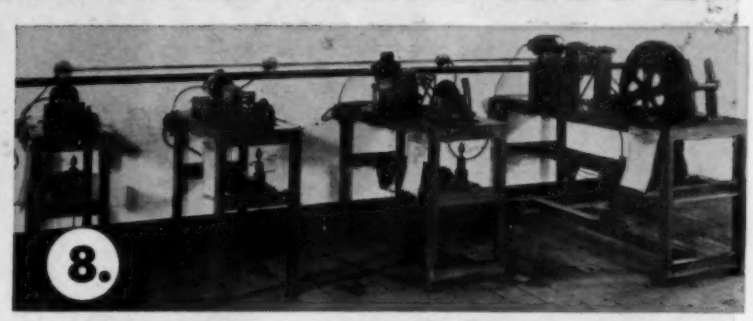
7. Another View Of Accelerated Fatigue Tester. Shows simultaneous testing of three different wire rope constructions. Here, in days, ropes are subjected to punishment equal to weeks or months of hard service.

8. Wire Fatigue Testers. The fatigue strength of wire rope is the sum total of the fatigue strength of the wires in its construction. Here, the wires in tension and bending are tested for fatigue strength.

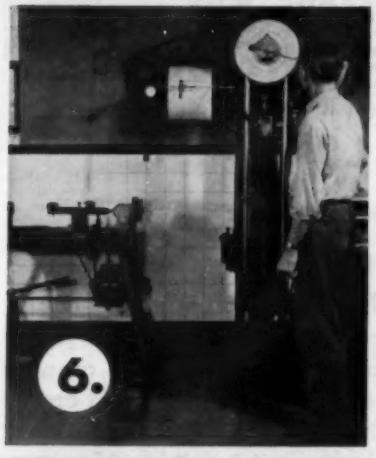


How Research Puts Longer Service Life Into WIRE ROPE





When you specify one of the Tuffy Wire Ropes, you can say Tuffy and forget complicated specifications

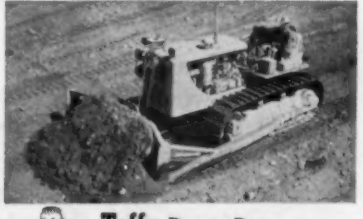


Tuffy Scraper Rope

It's flexible enough to withstand sharp bends, yet stiff enough to resist looping and kinking when slack. Save wasting sound rope—mount a reel on your scraper.

Tuffy Slings and Hoist Line

Tuffy Hoist Line, a longer running rope on all types of hoists. Slings of 9-part machine braided wire fabric. Kinking or knotting will not materially damage fabric.

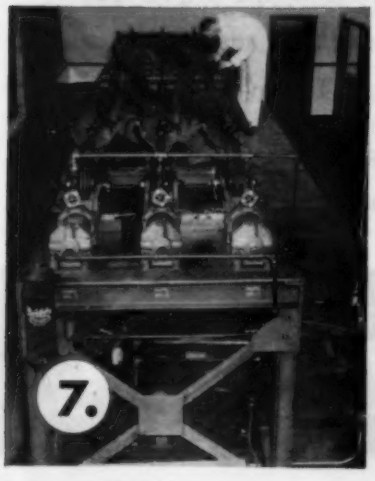


Tuffy Dragline

Constructed to give you maximum abrasive resistance with extra flexibility. Rides smoothly on grooves, hugs the drum when casting for full load.

Tuffy Dozer Rope

Increases service life . . . reduces down-time. 150' reels mounted on your dozers let you cut-off worn sections without wasting good rope. 1/2" and 9/16" diameter.



Your Tuffy Distributor Works For You

He's the man who can help you find a fast answer to all your wire rope problems. He's also the man who often knows as much about some requirements of your equipment as the men who made it. He's the man who's eager to supply the kind of service that will hold your patronage. Feel free to call on him anytime.

union Wire Rope corp.

2132 Manchester Avenue Kansas City 26, Missouri

Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand

3,000,000 TONS

...3,000,000 reasons why LIBERTY LIMESTONE CO. BUCHANAN, VIRGINIA bought this new LORAIN-85

The two Lorain Shovels in the photo tell a story of owner satisfaction. In the background, a 14½-year-old, 2-yd. Lorain is still digging away after moving 3,000,000 tons of rock and earth. In the foreground a brand new Lorain-85, joins the veteran, bought because of the outstanding service and performance record of the old machine. The new "85" is shown working against a 250-ft. face, moving up to 1500 yards of heavy rock per day.

Lorain-85's have such features as center drive concentration of engine power; anti-friction bearing-mounted swing and hoist drums; heavy-duty close-coupled design; independent chain crowd; Hydraulic Coupling power take-off; Torque Convertor also available; removable counterweight; self-equalizing turntable rollers on roller bearings; air controls for hoist, crowd, retract, crawler traveling and steering; tread lock and crowd brake; centralized lubrication; longer shovel booms (26'); air dipper trip; new, wide crawlers. Many, many more advantages, too.

See your Thew-Lorain Distributor for facts about the Lorain-85 and other models in the complete Lorain line.

THE THEW SHOVEL CO., LORAIN, OHIO

THEW LORAIN®

"Here's the plant that hits specifications easier and closer than any other plant we've ever operated . . ."

says **STREET BOYD**
of **STEINBERG-BOYD CONSTRUCTION CO.**
TULSA, OKLAHOMA

PAVING STONE	
OKLAHOMA SPECIFICATIONS	CEDARAPIDS PRODUCTION % PASSING
100% passing 3"	100%
95-100% passing 2"	97.7%
70-95% passing 1½"	85.1%
50-85% passing 1"	61.7%
——— passing ¾"	34.6%
15-40% passing ½"	19%
——— passing ⅜"	10.6%
0-2% passing No. 4	1.9%

CLASS A	
OKLAHOMA SPECIFICATIONS	CEDARAPIDS PRODUCTION % PASSING
100% passing 1½"	100%
90-100% passing 1"	95.9%
——— passing ¾"	70.7%
25-60% passing ½"	29.7%
——— passing ⅜"	12.4%
0-5% passing No. 4	1.4%

". . . and we're getting 180 to 250 TPH in Paving Stone, 140 to 160 TPH in Class A from our new Cedarapids Portable Crushing Plant."

You can hit specs right on the nose, too . . . outproduce any comparable plant . . . and do it at the low production costs that step up your profit. That's some of the reasons Steinberg-Boyd is so well satisfied with their new Cedarapids Unitized Portable Crushing Plant. It consists of a 2540 Portable Primary, an 1836 Twin Jaw Scalping Unit and the brand new Cedarapids Model 30C Secondary Plant featuring the Symons Cone Crusher. It's a plant designed to meet the big output and exacting gradation demands of modern turnpikes and toll roads.

Best of all, this set-up has all the features that *make money for you* on every job.

THESE EXCLUSIVE CEDARAPIDS FEATURES ASSURE BETTER GRADATION BIGGER PRODUCTION LOWER OPERATING COSTS

1. VIBRATING GRIZZLY
. . . by-passes most of the undersized material and fines. Increases primary output up to 25%.

2. TWIN JAW CRUSHER
. . . increases primary crushing production up to 40% over single jaw units and is especially efficient in abrasive rock or gravel.

3. HORIZONTAL VIBRATING SCREEN
. . . steps up screening capacity because the horizontal position of the screen cloth gives 12½% more screening area than an inclined screen of the same length.

4. SYMONS® CONE CRUSHER
. . . produces high tonnages of uniform, fine-crushed aggregate, even in the hardest or most abrasive rock or gravel. The Symons Cone Crusher, built by Nordberg, and world famous for big-volume, low-cost operation, has been combined with Cedarapids mobility and quality construction to give you a portable plant with the high-profit features of a permanent installation.

Cedarapids
Built by IOWA

IOWA MANUFACTURING COMPANY

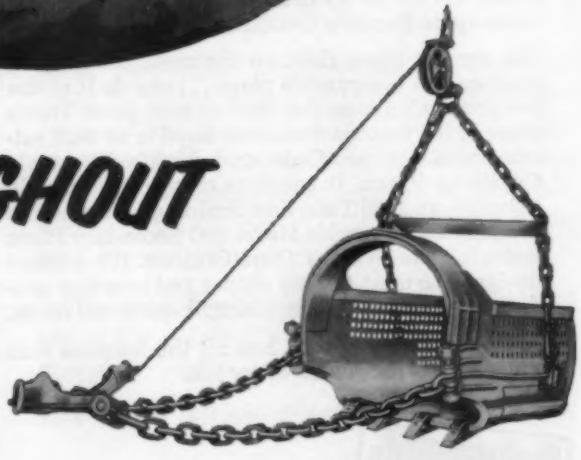
Cedar Rapids, Iowa, U. S. A.

Hendrix

Lightweight

DRAGLINE BUCKETS

IN USE THROUGHOUT THE WORLD...



A TYPE FOR
EVERY DIGGING PURPOSE

¼ to 40 Cubic Yards

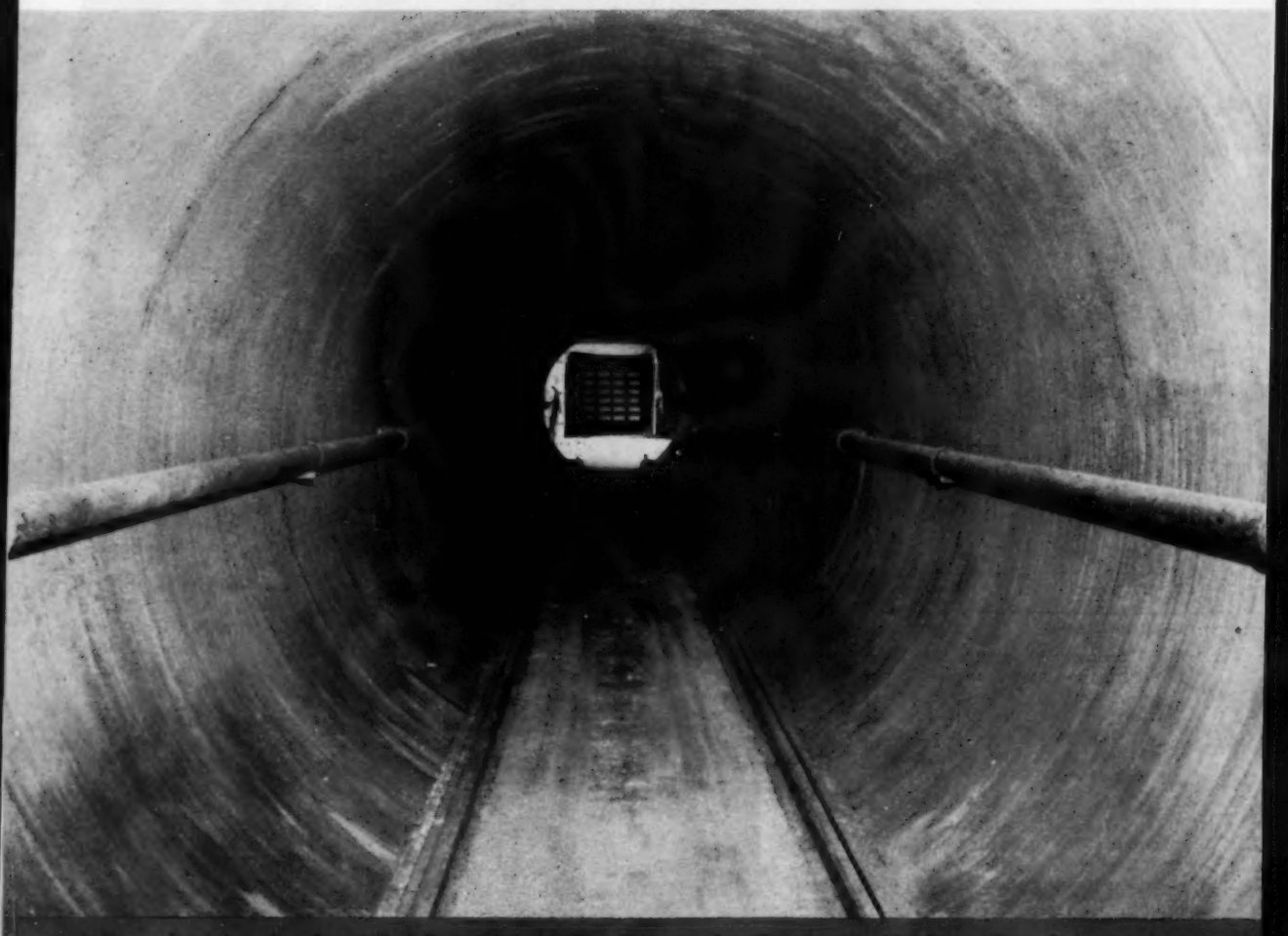
HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

For producers of Concrete Building Units, Pipe and Ready-Mixed Concrete.

JANUARY 1956

THE CONCRETE MANUFACTURER

A SPECIAL SECTION OF PIT AND QUARRY



Is There a Trend Away from Present Block Curing Methods? There is Here, as Seen Through a New High-Pressure-Steam Curing Autoclave.

Hilton Makes Hotel History

Ingenious Design Cuts Construction Costs on Dallas' 1001-Room Statler-Hilton

● Soon to open in Dallas, Texas, is the luxurious 18-story Statler-Hilton, one of the largest hotels built in 25 years, and latest in the group of 28 hotels welded together by Conrad N. Hilton into the world's greatest hotel organization.

Construction cost of this 1001-room hotel was $9,350. per room ($1.54 per cu. ft.), against an $11,000-per-room average for other new hotels in the system. The reinforced-concrete structural system not only saved money but contributed to the esthetic and functional development of the design.

Of flat-plate construction, the building is T-shaped, with three wings, each about 156 ft. long and 48 ft. wide, radiating from a central core. There are only two longitudinal rows of columns in each wing, with floors cantilevered 10 ft. beyond column centerlines to support the sandwich-panel walls. Floor slabs are 8 in. thick; no drop panels or column capitals used; only painting was required.

In this latest example of the advantages of reinforced-concrete frame construction, a total of 48,305 bbls. of Lone Star Cement was used. Equally proud is Lone Star of the part its products have played in other famous Hilton Hotels—the Waldorf-Astoria, the Shamrock-Hilton, Houston, and the new Statler-Hilton, Hartford, Conn.

As is so often the case, quality has a way of attracting quality.

THE STATLER-HILTON HOTEL, Dallas, Texas
Owner: HILTON HOTELS CORPORATION
Architect: WILLIAM B. TABLER, New York
Contractor:
ROBERT E. McKEE GENERAL CONTRACTOR, INC.
Dallas, Texas
Structural Engineers:
SEELYE, STEVENSON, VALUE & KNECHT, New York
Mechanical Engineers:
JAROS, BAUM & BOLLES, New York
Haydite Lightweight Block and Aggregate supplied by: TEXCRETE COMPANY, Dallas

LONE STAR CEMENTS COVER THE ENTIRE CONSTRUCTION FIELD

LONE STAR CEMENT CORPORATION

Offices: ABILENE, TEX. • ALBANY, N. Y. • BETHLEHEM PA.
BIRMINGHAM • BOSTON • CHICAGO • DALLAS • HOUSTON
INDIANAPOLIS • KANSAS CITY, MO. • NEW ORLEANS • NEW YORK
NORFOLK • RICHMOND • WASHINGTON, D.C.

LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 18 MODERN MILLS, 141,600,000 SACKS ANNUAL CAPACITY

Faster Concrete Work... Increased Profits with

③ COLUMBIA CALCIUM CHLORIDE

IN READY MIX

Ready mix producers can render a genuine service to customers by recommending the use of 3-C Columbia Calcium Chloride—especially at temperatures below 70°F. when the set and strength of plain concrete are retarded greatly.

You can add 3-C to the mix, either at your plant, or on the job. 3-C is easily controlled in either flake or liquid form. Here's what it will do for your customers:

- **Makes initial and final set three times faster**
- **Increases workability**
- **Increases early and ultimate strength**
- **Releases forms faster for re-use**
- **Cuts down on overtime**
- **Helps meet work schedules**

Start now! Recommend the addition of 3-C Columbia Calcium Chloride to your ready mix customers.

IN CONCRETE PRODUCTS

Regardless of how your concrete products are made, the use of 3-C Columbia Calcium Chloride will improve production and lower manufacturing costs. Here are some of the advantages:

- **Reduces time required for initial set**
- **Gives higher early strength**
- **Reduces curing time**
- **Reduces cracking**
- **Allows for quicker handling**
- **Reduces breakage**
- **Permits earlier shipping**

These advantages are especially important during cold weather. Calcium Chloride is not an anti-freeze, but the time required for protection in freezing temperatures is shortened, often as much as 50 percent. 3-C Columbia Calcium Chloride works equally well with normal, air-entrained and high early strength cements.

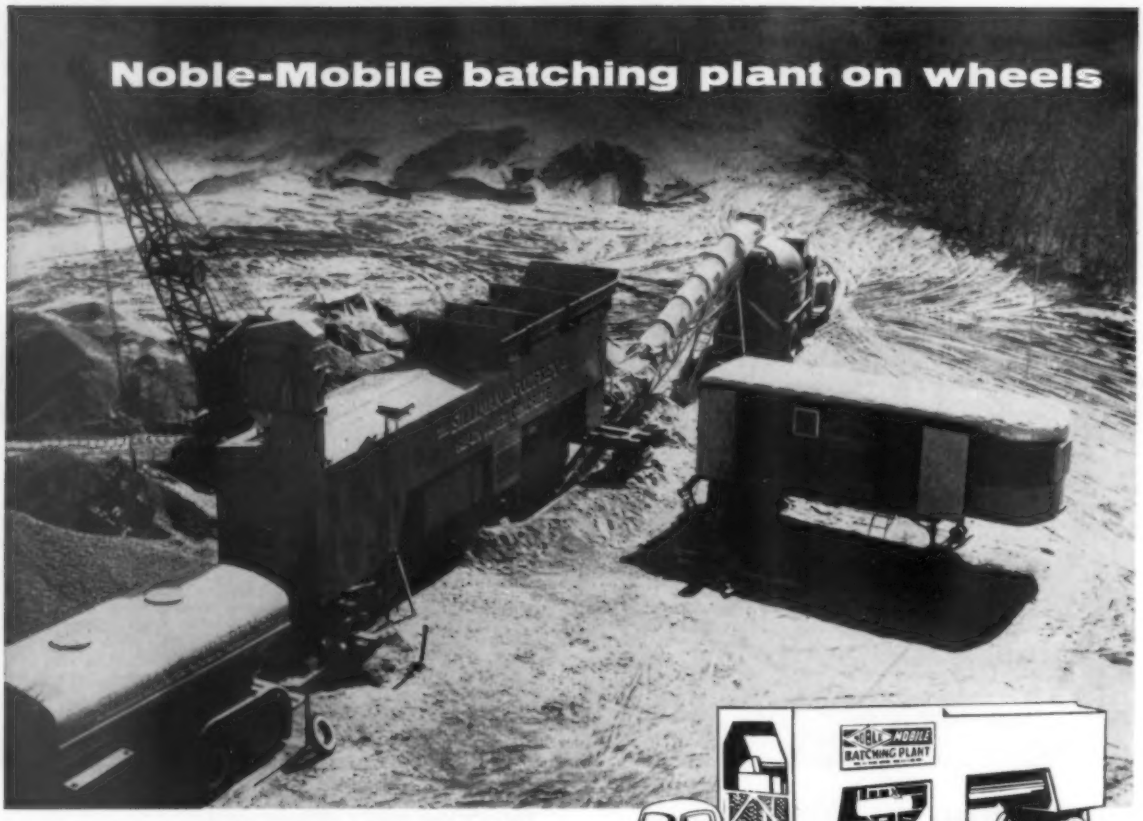
WRITE TODAY FOR COMPLETE INFORMATION . . . PLEASE SPECIFY WHETHER YOUR INTEREST IS IN READY MIX OR CONCRETE PRODUCTS

COLUMBIA-SOUTHERN CHEMICAL CORPORATION
SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY
ONE GATEWAY CENTER · PITTSBURGH 22 · PENNSYLVANIA

DISTRICT OFFICES: Cincinnati • Charlotte • Chicago • Cleveland • Boston New York • St. Louis • Minneapolis New Orleans • Dallas • Houston Pittsburgh • Philadelphia San Francisco

IN CANADA: Standard Chemical Limited and its Commercial Chemicals Division

Noble-Mobile batching plant on wheels



lets you batch at site of fringe jobs and makes those jobs pay

Photo of post-flood reconstruction job in Shelton, Conn., using Noble-Mobile. Owner: Silliman & Godfrey, ready mixed concrete.

Haul Noble-Mobile to job site like a semi-trailer • Set up in one day—no wiring, footings or crane time required • Charge aggregates with front end loader, crane or conveyor • Plant utilizes bulk cement—cement batched automatically • Excellent quality control • Maximum production from mixer trucks—short hauls, more yards per day • Production capacity 60 to 100 yards per hour. Covered by patents pending.

NOBLE BATCHING PLANTS

Portable, semi-portable or stationary plants designed and built by Noble Company • 1860 - 7th St., Oakland 20, Calif. TEmplebar 2-5785

Other Noble Company offices: 20950 Center Ridge Road, Cleveland 16, Ohio. EDison 1-3426.
518 First Ave. North, Seattle, Wash. MUtual 4878 • 117½ W. Manchester, Inglewood, Calif. ORegon 8-4457.

DISTRIBUTORS

Equipment Service Co.	Birmingham	Ala.	Boehck Engineering Co.	Houston	Tex.
Superior Equipment Co.	Phoenix	Ariz.	North Texas Equipment & Supply Co.	Dallas	Tex.
Western Machinery Co.	Denver	Colo.	Richards Equipment Co.	Waco	Tex.
T. B. Holmes & Sons, Inc.	Hartford	Conn.	Border Machinery Co.	El Paso	Tex.
James W. Bell Co.	Cedar Rapids	Iowa	Contractors Machinery Co.	San Antonio	Tex.
Manwaring Machinery Co.	Indianapolis	Ind.	Arnold Machinery Co.	Salt Lake City	Utah
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Borchert Ingersoll Co.	St. Paul	Minn.	Intermountain Equipment Co.	Spokane	Wash.
Wepco Equipment Co.	Cleveland	Ohio			

Loggers & Contractors Machinery Co., Portland, Ore.

The CONCRETE MANUFACTURER

January 1956

Let's Get Behind and Push!

THE recent announcement that the long-awaited and greatly expanded technical research program of the National Concrete Masonry Association is about to start is, in our humble opinion, one of the most important matters to come before this industry in many years. Regardless of the progress reached, no industry can afford to stand still at any point in its growth. The decision to proceed immediately in placing the spotlight of research on the many problems causing a stalemate of sorts in the further progress of the industry stamps the rank and file of the association as progressive men.

The new materials, methods, and products which have come to the front of late years create a challenge to every producer. Never before in the industry's 50-year history has it been so necessary to learn more about these practices and apply this knowledge intelligently. Any "sink-or-swim" individualistic attitudes of the past must be replaced at once by a "united we stand, divided we fall" conclusion which recognizes the fact that the concrete masonry industry faces an awakened competition well fortified to regain ground lost over the last decade or two. The benefits of the proposed research will accrue to all and should be supported by all. The 20 percent of the industry which has paid the tariff to date deserves no less than 100 percent co-operation for the rough road ahead.

Anyone who doubts that the job of solving the technical problems confronting block producers today is a stupendous one should peruse the list appended to the excellent report submitted to the members of the N.C.M.A. on the research program. There are few ready solutions to the 150 questions there propounded. Detailed and conclusive as this list may appear at first glance, and compiled though it has been by experts, no one will say that it is complete. The important point is to recognize that these problems do exist and that the development of practical and effective solutions will require the highest type of engineering and research work on a greatly expanded scale.

Our industry is composed of some 3,000 producers of some 50 different end products, these concrete manufacturers scattered over the 48 states, each in his own bailiwick. Until late years, each was disinclined to discuss with others what he was doing. The real race against competition was won ten years ago by intelligent research on very limited budgets — only one-fortieth of the average industrial manufacturing budget for research. It is indeed high time that this disparity be recognized and adjusted.

Ray L. Peck

Go South.. MR. BLOCK-MAKER, ..Go South

Canal Street is famed as America's widest and most brilliantly lighted thoroughfare.

Famous Absinthe House on Bourbon Street.

Up through the historic delta to New Orleans come ships from the seven seas!

New Orleans BECKONS YOU!

NCMA Convention to be held at Roosevelt Hotel . . . January 23, 24, 25, 1956

Three days of delightful relaxation and fun await you at New Orleans . . . storied city of romance and adventure. Of course, you want to find out what's new in automatic machinery for making high quality block, and to learn of new processes and production methods. But, in addition to the interesting program scheduled for the NCMA Convention, a host of attractions will make your visit memorable. Home of the Mardi Gras, New Orleans knows how to entertain . . . with its fabled "French Quarter" and world-famed restaurants, exciting mid-winter amusements and sports. Sightseeing in this historic city is an event in itself. In fact, life in New Orleans is like its coffee and food . . . richly exotic, spiced with a fascinating blend of the old world and the new. Days, and especially evenings, are mild and balmy, with a warm Gulf breeze and restful temperatures, making every moment of your visit really enjoyable. Come to the convention this year! You'll have the time of your life!

VISIT BESSER HEADQUARTERS

You are cordially invited to meet at the Besser Headquarters. Here you can talk and visit with successful Vibrapac block makers. Besser Sales, Service and Engineering Personnel will be on hand to discuss new ideas, new products, and Automation in the block plant. Ask for information on Besser Cooperative Advertising, planned and prepared by Besser to help you sell block. So come in and see us. A friendly welcome awaits you.

Join the NCMA - Your Association!

BESSER

VIBRAPAC

A 8613-1PBC

BESSER COMPANY

World's Leading Manufacturer of Concrete Block Machinery

ALPENA, MICHIGAN, U.S.A.

News of the Concrete Industries

N.C.M.A. Research Plan Approved by Membership To Be Implemented in 1956

In a letter to all members of the National Concrete Masonry Association, S. Carl Smithwick, president of the Association, announced on December 5, 1955, that activation of the proposed long-range engineering and technical research program is to be initiated at once.

Under intensive study and preparation by a subcommittee on long-range planning for the last two years, the program has been enthusiastically approved as submitted, by a large majority of the membership.

The subcommittee (of the Technical Problems Committee) included the following members: Jay Ehle, Cleveland Builders Supply Company, Cleveland, Ohio, chairman; Paul F. Bronson, Best Block Company, Milwaukee, Wis.; T. L. Goudvis, Concrete Masonry Corporation, Elyria, Ohio; Cedric Willson, Texas Industries, Inc., Fort Worth, Tex.

Benjamin Wilk, Standard Building Products Company, Detroit, Mich. (ex officio), and R. E. Copeland, director of engineering, N.C.M.A., Chicago, Ill., completed the committee.

According to the replies received on a questionnaire sent to all members earlier last year, some 350 members answered the four main division questions as follows:

(1) Do you believe it is desirable for the Association to increase its engineering and technical research work? (97 percent voted "Yes.")

(2) Do you believe the Association should undertake the proposed long-range engineering and technical research program as submitted? (91 percent voted "Yes.")

(3) If your answer to Question 2 is "Yes", when should the program be started? (1956, 69 percent; 1957, 5 percent; 1958, 0.5 percent.)

(4) If your answer to Question 2 is "Yes", which part of the program do you consider important? (All parts, 47 percent; increasing engineering activities, 7 percent; field engineering, 17 percent; research laboratory, 8 percent.)

The results of the returns have been analyzed according to plant size, geographical region, and membership classification. From this study it is evident that every segment of the membership definitely wants this important expansion of the engineering and technical research work and will support it. The board of directors of the Association has approved starting the program in 1956; it also moved to increase the dues rates by approximately 20 percent to provide the additional funds required to implement the program during the first year. The new dues schedule goes into effect January 1, 1956.

It is felt that the approval of this program and its early initiation assures the future success and expansion of the concrete masonry industry. It is urged on all producers that no better instrument can be found with which to combat the potential inroads of competitive materials than to support this program wholeheartedly. The vast scope of the problems which will be tackled with adequate facilities by trained personnel is such that only by concerted effort will adequate answers be found.

Coming Events

January 23-25, 1956—New Orleans. 36th annual convention, National Concrete Masonry Association. Roosevelt Hotel.

January 29-February 2, 1956—Chicago. 37th annual meeting, Associated Equipment Distributors. The Conrad Hilton Hotel.

February 5-8, 1956—Louisville, Ky. Sixth annual convention and show, Mason Contractors Association of America, Inc., Kentucky Hotel.

February 13-16, 1956 — Chicago. **26th annual convention and biennial exhibit, National Ready Mixed Concrete Association. Headquarters, Conrad Hilton Hotel; exhibit. Coliseum.**

February 20-23, 1956—Philadelphia. 52nd annual convention, American Concrete Institute. Bellevue-Stratford Hotel.

March 6-10,1956—Colorado Springs. **48th annual convention, American Concrete Pipe Association. Broadmoor Hotel.**

Cleveland Builders Supply Forms New Division—Adds Prestressed Concrete

A new division of Cleveland Builders Supply Company, Cleveland, Ohio, has been formed to produce LEAP prestressed concrete slabs and joists. This division, which is to be known as the Cleveland Precast Floor and Roof Division of the company, is licensed to produce the double-tees, channels, and tee joists designed by the Lakeland Engineering Associates, Inc., of Lakeland, Fla., and sell these products in northeastern Ohio. It will be the 17th firm licensed to manufacture under this system.

For the production of these items a 400-ft. long double-tee prestressing bed will be set up by the company at the Hugo yard in Cleveland. This bed will be capable of producing double-tees for roofs up to 50 ft., and for floors to 40 ft.; roof channels up to 60 ft., floor channels up to 50 ft., inverted tee beams up to 60 ft., and tee joists up to 50-ft. spans.

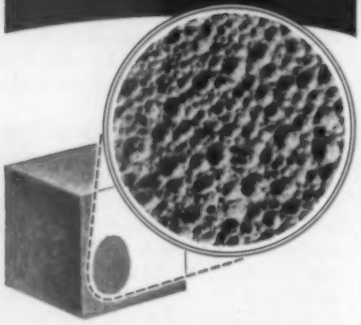
The bed is to be steam-heated to elevate the curing temperatures overnight to 145 deg. F. This will accelerate the high-early strength of the concrete to 4,000 p.s.i. in 18 hours; at this time the product is released from the bed. By making a pour every day the crew will be able to produce approximately 1,500 sq. ft. of double-tee roof slabs daily.

The plant will be set up to use sloping prestressing strands, which are first pulled parallel and quite high in the stem cavity of the long form. They are blocked up at the slab ends and then depressed at midspan or at any point desired. This results in a considerable savings in steel, a lower concrete stress, good control over camber, longer spans, and heavier loads. It permits precompression of the concrete in the desired locations.

The tee-shaped members have no tendency to collapse suddenly. They are so flexible that at high overloads they merely deflect and recover again after the removal of the load, with no signs of structural damage.

Lou Hubbard will manage the prestressing operation for C.B.S. Jay Ehle is vice-president in charge of operations of the company.

Introducing
Elastizell
. . . a basis for making
LIGHT WEIGHT, STRONG,
INSULATING concretes
from universally
available materials



what can YOU do
with this product
of many uses?

ELASTIZELL-TYPE
CONCRETE "PLUSSES" . . .

- LIGHT WEIGHT . . .
  big savings in handling and design
- STRONG . . .
  strengths for structural applications
- MOISTURE-RESISTANT . . .
  cork tile on grade
- SELF-INSULATING . . .
  comfort on grade
- POSITIVE DENSITY CONTROL . . .
  results as predetermined
- HOMOGENEOUS STRUCTURE . . .
  uniform strength and insulation

Write, wire or 'phone . . .
ELASTIZELL CORPORATION OF AMERICA
158 FLETCHER STREET • ALPENA, MICHIGAN
'PHONE 1080

• Thomas H. Monaghan (left), president of the Federal Concrete Pipe Company, Columbus, Ohio, and William Buss, vice-president and production manager, look on as the first pipe is cast in the firm's new plant. Both men are former executives of the Universal Concrete Pipe Company.

52nd A.C.I. Convention Slated For Feb. 20-23 in Philadelphia

The American Concrete Institute will hold its 52nd annual convention, February 20-23, 1956, at the Bellevue-Stratford Hotel, Philadelphia, Pa.

The first day will be devoted to technical committee meetings, and the remaining three days will feature general sessions. The convention program will include sessions on new A.C.I. standards and committee reports, the A.C.I. Building Code, prestressed concrete, shrinkage in concrete, concrete construction and design, and the annual research session.

Karl P. Billner, president, Vacuum Concrete, Inc., Philadelphia, is general chairman of the local committee on arrangements.

Red-E-Crete, Inc., of Glendale Opens Plant in San Diego

An entirely mechanized facility has been completed at San Diego, Calif., by Red-E-Crete, Inc., of Glendale, Calif., manufacturers of sacked dry ready-mix and asphalt mix. The plant occupies 4,000 sq. ft. and has a capacity of 1,000,000 sacks annually. All mixing, sacking, and weighing is done automatically.

In charge of operations at San Diego is B. B. Burgess, a veteran employee of the firm.

Another product of the concern is Concrete Glue, which is used to bond concrete, brick, tile, steel, or wood to concrete surfaces.

Dixieland Plant Operator—Efficient and Charming—Heads Growing Concern

There are probably many "boss ladies" in the concrete industries; but down Tampa way, they say that Mrs. John S. Brengle, president of Brengle Brothers, Inc., is not only a capable business woman, but a charmer as well!

Mrs. Brengle inherited her job when her husband became ill. At first she served in the capacity of pinch-hitter; and when Mr. Brengle died, she took the responsibilities of the business upon herself.

As head of the oldest concrete block concern in Tampa, she has seen the plant expand from a modest setup to a sizable industry. Products include, in addition to concrete masonry units, ready-mixed concrete, several types of concrete brick, stepping stones, lintels, sills, and prefabricated steps. When she took over the concern at the time of her husband's death, Mrs. Brengle also owned a house-moving business! However, she later disposed of this service.

President Brengle in the yard of her plant.

This capable company president is also active in numerous civic, cultural, and service groups, but not to the exclusion of family interests. Sewing for her eight grandchildren is one of her pet projects. Mrs. Brengle is also an enthusiastic traveler. Having visited many points of unusual interest in this hemisphere, she is now anticipating future tours to Asia and Africa.

Bryce L. Weed, 47, a partner in the Douglas-Weed Concrete Company, Sylacauga, Ala., died recently.

Here's why you can

HAUL BIGGER LEGAL PAYLOADS

BLAW-KNOX *Hi-Boy* TRUKMIXERS mount on short wheelbase trucks

Only Short Wheelbase *MANEUVERABILITY* gets into tight spots quickly

Mounting the motor at the rear and the transmission at the end of the combination pedestal water tank, permits center of weight to be moved 20″ forward so the front axle carries maximum legal load and allows use of shorter wheelbase conventional cab type trucks. These exclusive design features allow you to haul extra payload every trip and make more trips per day with Blaw-Knox Hi-Boy TRUKMIXERS. With Hi-Boys mounted on shorter wheelbase, more maneuverable trucks, you get loads through traffic, onto the job site and up to the forms *faster.*

Dozens of other practical, profitable features that assure best weight distribution and most efficient loading, mixing and delivery, have been incorporated in 4½, 5½ and 6½ cu. yd. Hi-Boys. Have your nearest Blaw-Knox distributor explain them to you today.

BLAW-KNOX

BLAW-KNOX COMPANY

CONSTRUCTION EQUIPMENT DIVISION

Mattoon, Illinois

R. C. Valore Jr., Appointed To Division Director's Post On Texas Industries Staff

Rudolph C. Valore Jr., formerly a cement and concrete specialist with the National Bureau of Standards, has been appointed director of research and development in the engineering department, Concrete Division of Texas Industries, Inc., president Ralph B. Rogers has announced.

Mr. Valore resigned from the National Bureau of Standards on November 7, after 17 years of service to join Texas Industries, Inc. In 1954 he was awarded the Wason Medal, highest award of the American Concrete Institute, for the most meritorious technical paper published during the year.

During his service with the National Bureau of Standards Mr. Valore supervised the physical testing of cement for several years. His work took him into many phases of conventional and lightweight concrete research, and he has become internationally known for his studies of cellular concrete, research on frost action on concrete, and dynamic tests of materials.

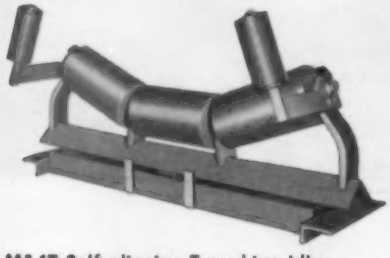
R. C. Valore Jr.

His accomplishments also include the design and invention of electrical and electronic devices for testing concrete. He has written a number of technical papers on cement and concrete which are now in general use as reference data.

MARCO BELT CONVEYOR IDLERS

KEEP MATERIALS FLOWING SMOOTHLY AT LOWEST COST TO YOU...

M14 Standard Troughing Idler



M14T Self-aligning Troughing Idler

M14M Impact Troughing Idler

HERE'S HOW...

Each bearing is pre-lubricated at the factory with a special grease that ends the need for any further lubrication in the field.

Each bearing is precision ground ...made with the same accuracy and skill as automotive bearings.

Each bearing is "unit-sealed." This eliminates separate closure parts...sealing efficiency is not dependent upon constant bearing adjustment.

Each idler has an all-steel frame with a self shedding base that prevents material build-up.

Each idler has formed-steel deflector shields that protect bearings from any material entering between end rollers and brackets.

These are the facts. And they all add up to the sound proof that MARCO offers you perhaps the finest, most complete line of ball bearing idlers available to American industry today.

MARCO dealerships are available in some areas.

Your inquiry will receive prompt, confidential attention.

OTHER MARCO PRODUCTS

- Tubular Frame Belt Conveyors
- Bucket Elevators • Control Gates
- Feeders • Bins • Solid and Self-cleaning Pulleys

E. F. MARSH ENGINEERING CO.

4324 W. Clayton Ave. St. Louis 10, Mo.

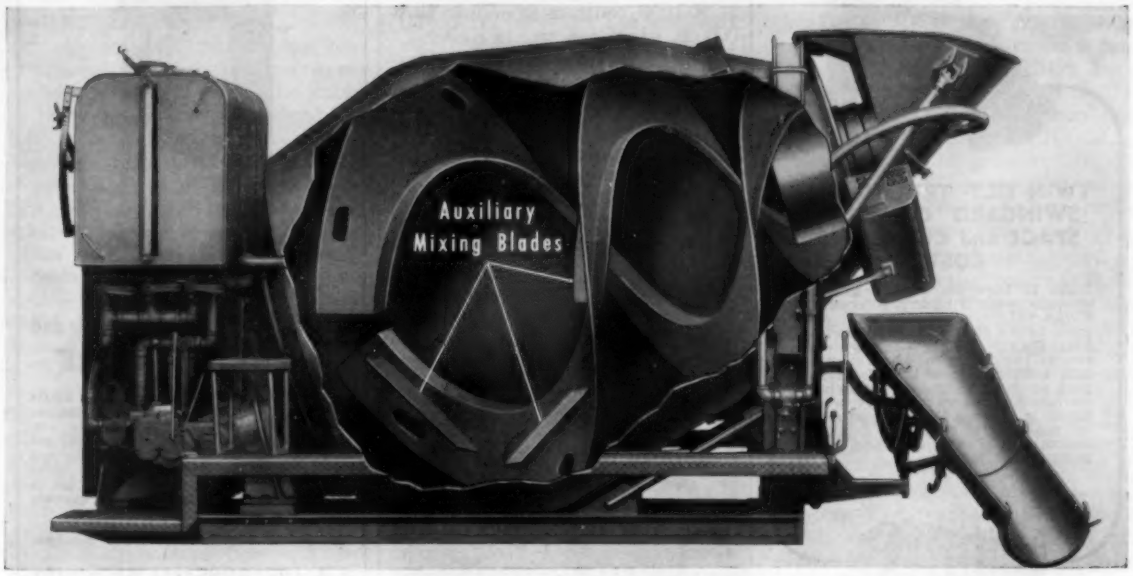
George M. Friel of Go-Corp Dies after Brief Illness

George M. Friel, 79, who was associated with the Gene Olsen Corporation, Adrian, Mich., in its sales department, died on November 29 in Columbus, Ohio, after a brief illness.

Considered by many of his business associates as the dean of concrete block machinery salesmen, Mr. Friel began his career in 1909 in the employ of the Hayden Machine Company of Columbus, Ohio. He was instrumental in developing an early block machine, known as the Hayden Stripper. Subsequently he was identified with the following firms, as sales manager and in other sales capacities: Anchor Concrete Machinery Company, Consolidated Concrete Machinery Company, Besser Manufacturing Company, Stearns Manufacturing Company. He was with the Gene Olsen Corporation at the time of his death.

Arnold Darrow and Marshall Greenberg, owners of the Scott-Marshall Company, have opened a plant in Addison, Tex., where they will manufacture Heatherstone colored cast concrete brick. The rough, split-faced brick will be distributed in assorted standard colors.

WESTINGHOUSE Transit Mixers



The mixers with "double-action" mixing drums for faster and more uniform mix...

• Westinghouse mixing drums are designed for one-direction, open-hopper mixing. Spiral mixing blades are deeper than those of most mixers —and—each spiral is equipped with three auxiliary mixing blades welded to the spirals. These six auxiliary blades (each 36 in. x 7 in.) produce a criss-cross mixing action which prevents segregation and produces the most thorough and uniform mix you ever saw. Furthermore, a Westinghouse is ready to discharge concrete immediately on short hauls where other mixers have to stand by for additional mixing before discharge.

2-Speed Transmission is standard on all models. Provides wide range of drum rotating speeds for mixing or agitating.

. . .

Westinghouse Transit Mixers are available in 5 sizes — 4½ to 6½ yd. Before buying another mixer mail coupon below (attached to your letterhead) for descriptive folder.

ADAMS DIVISION
LeTourneau-Westinghouse Co., Indianapolis, Indiana
Member of NRMCA

Clip and Mail For Descriptive Literature

Send new folder on Westinghouse Transit Mixers to

Name.....

Company.....

St. Address.....

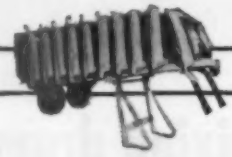
City & State.....

CM

TWIN-TILT TRUCKS CUT LABOR COSTS

TWIN-TILT TRUCKS with SWINGARD CONSERVE SPACE and CUT LABOR COSTS.

Built to turn on a dime and to operate with finger tip control, TWIN-TILT trucks allow one man to do the work of two. The SWINGARD safety feature of sturdy bar iron construction, protect both man and load from injury or damage. The guard swings completely out of the way when truck is moving the load, to safety position if truck is dropped, automatically catching and supporting the load.



UP TO 1200 LBS. WITH FINGER-TIP CONTROL.

TWIN-TILT is the only hand operated truck with the patented, labor saving auxiliary frame. It is of all metal construction with full welded frame, (no bolts or rivets to work loose). Engineered for maximum ease of operation. Twin-Tilt trucks require a minimum of space in turning or moving and lift up to 1200 lbs. palletized materials with finger tip control. The Swingard safety feature can be attached to any heavy duty hand truck.

For completely descriptive literature write,

TWIN-TILT TRUCK CO.
P. O. Box 11 St. Bernard
Cincinnati 17, Ohio

$1,500,000 Kaiser Contract Awarded to Ross Corporation

Work began December 15 on the new Kaiser Aluminum and Chemical Corporation plant in Ravenswood, W. Va., where the Ross Concrete and Mortar Company was awarded a $1,500,000 contract to supply 107,000 cu. yd. of concrete to Kaiser.

J. Jay Ross, president of Ross Concrete and Mortar, also announced the opening of the company's new $400,000 sand and gravel plant at Apple Grove, Ohio, four miles from the construction site.

It is estimated that 200,000 tons of sand and gravel will be used for the Kaiser contract, which is expected to be completed by June, 1957.

New Concrete Block Plants Indicate Expanding Market

Production of concrete blocks was started recently in Harrisonville, Mo., by the Concrete Building Products Company. John L. Strandberg Sr., president, stated that construction of a concrete beam and prestressed concrete channel slab plant is also contemplated. Plant capacity is estimated at 5,000 blocks per day. All products will be sold under the trade name of "Vibracrete".

Pyramid Block Company, Inc., began operation of a 9,000-block-per-day plant near Myrtle Point, Oreg. Products include 34 types of concrete block and tile, and it is expected that 250 different types of block and tile will be produced eventually.

W. D. Stonecipher and John Denton, co-owners of the Brickcrete Company, have opened their newest plant, in Manchester, Tenn., where five counties are serviced by the Brickcrete organization.

New Canadian firms are also springing up. Pressur-Crete Limited, founded recently by five Winnipeg building material suppliers, has begun production of blocks at the rate of 6,000 per day. This rate is to be increased to 8,000 when the company enlarges its quarters for 1956 output.

In the Seattle area, Graystone, Inc., according to Fredric M. Kettenring, president, has installed a new system of electronic controls to increase block production. The controls automatically regulate the five basic mechanical factors in block making. A new pipe-making machine which will manufacture standard concrete pipe from 4 to 12 in. in diameter has also been added to the plant equipment.

Jones COMPRESSION TESTING MACHINE

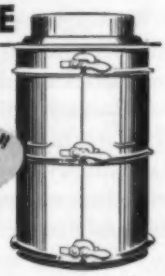
for more economical mixes, and uniformly higher strength

By doing your own testing of concrete blocks and cylinders, you will immediately discover anything which may have gone wrong with the aggregate, grading, mixing, etc. This will help you maintain more uniform quality and develop more economical mixes. The Jones (formerly Yoder) testing machine is low in first cost, specially designed for concrete products plants.

Send for list of satisfied users and literature.

***J. A. Jones* CONCRETE MACHINERY**
108 Horning Road, Pittsburgh 34, Pennsylvania

CALL ON Quinn For QUALITY CONCRETE PIPE FORMS



"STANDARD" The World Over

Backed by over 45 years of reliable service, the QUINN Heavy Duty form is recognized as the STANDARD design and the finest concrete pipe form everywhere. Used in making pipe by vibration, spading or tamping. Sizes for pipe from 10" to 120" and larger. Tongue and groove (as shown) or bell end pipe in any length desired. If your pipe orders specify extra large sizes, odd shapes or unusual lengths, there's a Quinn form made to produce the finest pipe at lowest possible cost.

Also Manufacturers of
QUINN CONCRETE PIPE MACHINES

Free CATALOG

Illustrates our complete line of equipment. Contains pages of valuable tips for the concrete pipe manufacturer. Write today for your free copy and estimates.

Quinn WIRE & IRON WORKS
BOONE, IOWA

Men of the Industry

President Earl W. Peterson

EARL W. PETERSON, newly-elected president of the National Concrete Masonry Association, probably got into the habit of being a president, when his high school graduating class bestowed that honor on him in 1925. Since then it appears to have become a practice with him eventually to head whatever he tackles. A brief rundown on these presidencies would include the following: Omaha Executive Association (1943); Omaha Builders Exchange (1950); Omaha Industrial Housing Corporation (1953—); Concrete Masonry Association of Omaha (1945—); Nebraska Concrete Masonry Association. (He founded the latter in 1945.) Finally he was elected president of N.C.M.A., an office which he takes over at the New Orleans meeting this month. As he is now vice-president of his firm, Ideal Cement Stone Company, Omaha, Nebr., he may look forward to adding at least another to his presidential crowns in the coming years.

It is difficult to get Earl Peterson to talk about himself. Always anxious to praise the work of the organizations which engage most of his time, he is equally reticent to speak of his own generous activities in such groups. Through diligent probing we have been able to gain some of the facts of the background of this interesting personality.

Born June 27, 1905, in Omaha, he attended grade and high school in that city. (Incidentally, while he was attending high school, he was president of the student council and of the debating society.) On his 22nd birthday, he married his lifetime sweetheart, an event which, as Earl phrased it, "precluded any further education". However, he managed to attend Y.M.C.A. night school for many years.

He started working in the South Omaha plant of the company in 1925 as a dispatcher. Later that year he was transferred to the machine shop as an apprentice. In that period of gaining experience he also doubled as a truck driver. The next two years were spent in the block-making department and later in the special department casting ornamental garden furniture and trim stone. After the death of his father in 1927 he was made a director of the company and soon after that became chief dispatcher.

The Ideal Cement Stone Company was formed in 1906 by Earl's father,

Earl W. Peterson

N. J. Peterson, and his uncle, Charles Peterson. The founders saw in the rock-faced concrete blocks an easy way to preform concrete units as a facing for small bridges and culvert structures for the Union Pacific Railroad, instead of using the hand-carved quarry stone for this purpose. During the first year the business was operated in a small building ten blocks from the business center. It continued to grow and expand, and in the early 1920's the firm was considered one of the country's larger block plants. The two plants in Omaha were producing 1,500,000 units annually.

Earl Peterson has always been a staunch believer in association work. He helped form the Nebraska C.M.A. and counselled with groups from Kansas and Iowa regarding similar organization of state associations there. At the organizational meeting of the Missouri-Kansas C.M.A. he was the leading speaker. As chairman of the promotional committee of the Nebraska C.M.A. he was instrumental in getting that body to hire an executive secretary and worked hard to get the members to further the cause of concrete masonry. That his efforts have been highly successful is attested by the fact that this state association was granted the first charter by N.C.M.A. Moreover, its 14 present members produce over 90 percent of the block output in the state, and all are members of the parent association.

Mr. Peterson did similar promotional work with the Omaha C.M.A., which he still heads. Members of this organization are likewise 100 percent members of the national body. He relates how, in both state and local groups, the going was hard for some 20 years; each plant went its own way, and consequently co-operative effort was at a low ebb.

While thus helping his fellow producers, Earl managed to pay close attention to his own company's affairs. He served as secretary for the 17 years after becoming a director in 1927, as vice-president and secretary from 1948 to 1953, and as vice-president for the succeeding two years. He was a salesman from 1936 to 1945, and plant manager in charge of physical equipment, purchasing, and plant and driver personnel after the retirement in 1947 of his uncle, Charles Peterson.

We believe that he was mainly responsible for several periodic expansions of the company's facilities, starting with a five-year program in 1945, to mechanize as fully as possible its plant operations. From the production of 8,000 units per day at that time, the additions of new production units, mixers, weigh batchers, boilers, storage bins, etc., and appropriate structures to house them, increased the production to the present 30,000 units daily in a two-shift operation.

Supplementing the regular concrete block, the firm has also acquired merchandising lines such as fireplace equipment, fire brick, cement paint, steel windows and wall reinforcing. It now operates the equivalent of four joist machines and a precast concrete division which currently employs eight men producing lintels, sills, coping, splash blocks, trim stone, stepping stones, and area walls. Five acres of paved yard storage space carries a stock of over 500,000 units.

Operations are conducted within

*Incidentally, while he was attending high school, he was president of the Student Council and of the Ecremmoc Debating Society.

an area of 150 miles from Omaha. A fleet of 25 company-owned trucks and ten other contract haulers is used to carry the products to customers. Business outside the city proper is handled through a number of building supply dealers in various outlying towns. The company is celebrating its golden anniversary of fifty years in business in 1956, and if we know Earl Peterson, this will probably include another "five year plan" of prime consequence, to make the best possible product at the lowest possible cost.

The firm has a record in public activity, having maintained a Chamber of Commerce membership for over 30 years. It participates actively (100 percent) in United Service Community Chest Drives, Red Cross, Omaha Safety Council, Y.M.C.A., and other local public aid fund raising. Ideal has group insurance, a health and accident plan for its employees, and a retirement plan for key personnel. It also sponsors Junior American Legion ball teams and Boy Scout activities. Because there had been an abnormally high accident frequency in the plant operations in the early years, resulting in an alarming and costly increase in insurance premiums, plant safety became one of Earl Peterson's prime concerns. His efforts to promote safety through the years have been so successful that the company is now enjoying a 50 percent credit off manual rates for insurance. Ideal won the N.C.M.A. Class B Safety Award for the last two years, and according to Mr. Peterson, will repeat this commendable performance very soon.

He accepted a directorship of N.C.M.A. in 1951, feeling that this would allow him to expand his association interest on a national scale. He serves on the budget, membership, and the local, state, and regional committees, and is chairman of the accident prevention committee of the association. This last service he considers a real challenge to help the industry, insurance premium-wise, by making the members safety conscious. The average man might be burdened by these association activities. Not so Earl Peterson. That his capabilities were early developed is shown by the high school "graduation verse" describing him—"Earl is a good all-round boy; he excels in no one thing—he excels in all of them."

The Petersons live in the west section of Omaha with two of their three children, Peggy, 19, and Judy, 12. A son, Warren, 27, is a salesman and assistant secretary of the company, representing the third generation of Petersons taking an active part in company affairs. The family also maintains a summer home at Lake Okoboji, Iowa.

Build Better Walls with Quality Guaranteed

BLOK-LOK

FLUSH-WELDED JOINTS—STRONGEST BY COMPARISON

Plain or Deformed

In Solid or Cavity Walls

Prefabricated PARTITION-LOK

Prefabricated CORNER-LOK

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Makers of most complete line of masonry wall reinforcement.

Flush Welded Joint

BLOK-LOK neatly and securely bundled, in 12-ft. or 16-ft. lengths (25 pieces each), in heavy weight cardboard wrappers; ends plainly printed to identify type and size for inventory and order-filling convenience.

Finishes

Galvanized wire, hot-dipped galvanized and brite basic.

BLOK-LOK Standard 9 gauge steel wire

BLOK-LOK Special Standard 8 ga. deformed side rods, 10 gauge galvanized cross rods, 16" centers

BLOK-LOK Heavy 3/16" rod with 9 ga. cross member

FS-Standard 8 ga. deformed side rods by 12 ga. cross rods flush welded on 16" centers, all galvanized wire.

YOUR ASSURANCE OF

- Small Masonry Joints
- Minimum Job Breakage
- Maximum Structural Strength
- No Obstruction to Mechanical Trades

Extensive testing laboratory reports serve to confirm the sound engineering of Blok-Lok's design. Exceeds requirements of A.S.T.M. specifications A-82-34 and A-15-52T.

Distributors and dealers located in all major cities of U.S. and Canada.

FREE—Concrete Block Wall Calculator identifies number of blocks required. WRITE FOR YOURS TODAY

A A WIRE PRODUCTS COMPANY

7211 COTTAGE GROVE AVE., CHICAGO 19, ILL. PHONE: RADCLIFFE 3-8313

Virginia Pipe-Products Firm Building Plant at Lynchburg

Stanley R. Navas, president of the Concrete Pipe and Products Company, Richmond, Va., has announced that the firm will establish a concrete pipe manufacturing plant in Lynchburg, Va.

With an initial investment of more than $100,000, the company will build its own facility to produce concrete pipe and other products. Mr. Navas stated that construction will begin immediately. It is anticipated that production will get under way this spring. About 30 persons will be employed initially.

R. Frank Miser, 44, vice-president of the Old Fort Supply Company, in Fort Wayne, Ind., and manager of its Readymix Concrete Division, died on October 31. Mr. Miser had been with Old Fort Supply for 16 years.

"RCA RADIO REDUCED OUR OVERTIME 20-30% PER MONTH"

(Above) Mr. Clarence Goetz, Vice-President, Clifton Concrete & Supply Co. and (below) one of the radio-equipped Clifton trucks.

—*Reports* **CLARENCE GOETZ**
Clifton Concrete & Supply Co.
Cleveland, Ohio

"It's the greatest thing that has happened to the industry since the advent of the high-dump mixer truck! RCA Radio has reduced our overtime anywhere from 20 to 30 per cent per month. We've made extra profits by being able to close our plant earlier at night."

And he continues:

★ Greater volume of production is possible. Ten trucks, radio-equipped, are equal to 11 trucks.

★ Efficiency in dispatching trucks makes entire operation more efficient. Drivers are supervised at all times, reducing unnecessary trips and delays.

★ Drivers like 2-Way Radio. It relieves them of responsibility—they get answers to questions immediately without having to stop to telephone.

★ RCA 2-Way Radio assures much better service. It not only makes money for us—it makes money for our customers.

Why are the leaders choosing RCA 2-way Radio?

Most of them say they are impressed by RCA's fine service organization and the years of RCA leadership in radio and electronics. Look for these marks of quality: Superior crystals, tubes and microphones for clearer talking, longer life . . . heavy gauge steel case for rugged service . . . color-coded tuning for simplest maintenance . . . expert service by RCA Service Company to assure peak performance.

DISPATCHER 2-WAY RADIO TO DRIVER

Get the whole story—Mail Coupon

RADIO CORPORATION of AMERICA
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☐ Please send me complete information on the use of 2-Way Radio in my business.

☐ Have RCA Communications Specialist make a free RADIO SURVEY of my business.

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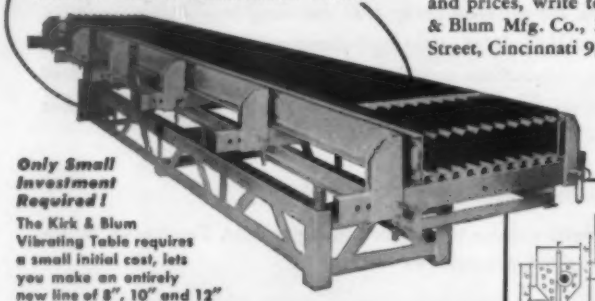
Add a New Profit-Maker

increase your volume

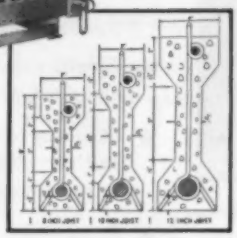
PRODUCE CONCRETE JOISTS, LINTELS AND FENCE POSTS with the KIRK & BLUM HEAVY DUTY VIBRATING TABLE

Your experience in the building trade should make it easy to build up a profitable business in this new line. The products are simple to make, have unusual strength, are termite proof. The KIRK & BLUM Type "S" Heavy Duty Vibrating Table is capable of multi-production of concrete joists, allowing a fine profit-margin. Easily produced by unskilled operators. For complete details and prices, write to The Kirk & Blum Mfg. Co., 3112 Forrer Street, Cincinnati 9, Ohio.



Only Small Investment Required!

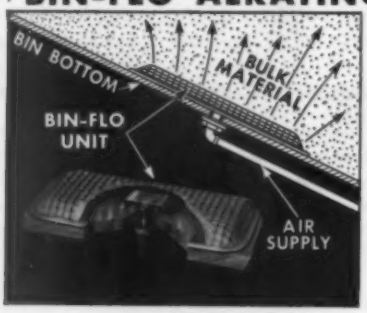
The Kirk & Blum Vibrating Table requires a small initial cost, lets you make an entirely new line of 8", 10" and 12" joists in 20 and 24 ft. lengths.



KIRK & BLUM

Manufacturers of steel forms of all types . . . Curb, Gutter, Sewer, Road

BIN-FLO AERATING UNIT



Provides Steady Flow of Dry, Finely Ground Materials which tend to bridge in storage. Uses only small amount low-pressure air.

BIN-DICATOR BIN LEVEL INDICATOR

For All Bulk Materials

signals change in level; automatically starts and stops filling and emptying equipment.

THE BIN-DICATOR CO.

13946-W1 Kercheval • Detroit 15, Mich.

NEW DETAIL DATA BOOK FREE

A.C.I. Expands Bibliography On Prestressed Concrete—Supplement Also Available

The 1955 edition of *Bibliography on Prestressed Concrete* has been published by the American Concrete Institute. Expanded to 103 pages, the book now lists more than 2,100 American and foreign literature references on the subject of prestressed concrete, published from 1896 into 1955. A separate section lists 75 United States, British, German, and French patents.

This publication was prepared as a part of the work of the A.C.I.-A.S.C.E. Committee 323, Prestressed Reinforced Concrete. Price, $2 per copy. The book may be obtained from the American Concrete Institute, 18263 West McNichols Road, Detroit 19, Mich.

A supplement containing the material added to this new edition is available (at 35 cents) to those who purchased the 1954 edition.

Gerhold Concrete Products Relocates Offices and Plant

James Gerhold, partner and manager in the Gerhold Concrete Products Company, Norfolk, Neb., announced the company's relocation.

The new building, constructed of steel and concrete, houses the offices, main plant and drying facilities.

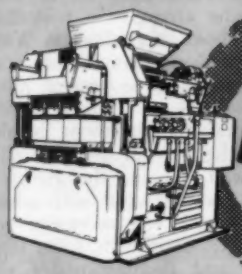
Gerhold Concrete Products also has a plant in Columbus, Neb., which is managed by William Gerhold Jr., brother of James.

The concrete products firm is an addition to the Gerhold Company of Columbus, which operates a number of gravel pits, including those near Battle Creek and Meadow Grove, Neb.

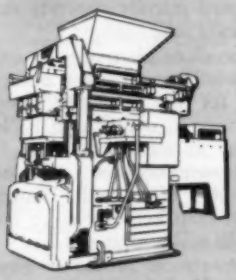
George A. Paro, 60, plant superintendent for the Bedford Hills Concrete Products Corporation, Bedford Hills, N. Y., passed away on November 14 after a three month's illness. Mr. Paro had been associated with the firm since 1925. Daniel Ryan has been appointed production superintendent and Lyle Blaylock was named buildings and yards superintendent.

Gulf Materials Company, Dallas, Tex., a ready-mix concrete producer, has purchased the Harris Ready-Mixed Concrete Company of Robstown, Tex., and its four plants at Sinton, Mathis, Taft, and Robstown. Jim Counts, president and general manager for Gulf Materials, stated that 17 Harris employees will continue with his company.

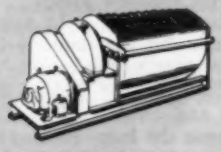
COLUMBIA BUILDS A COMPLETE LINE OF CONCRETE BLOCK PLANT EQUIPMENT
Including:



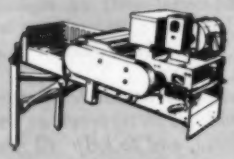
MODEL 12 3-BLOCK MACHINE



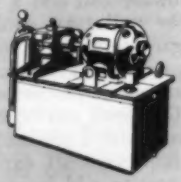
12" HIGH BLOCK MACHINE



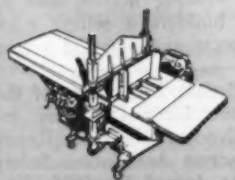
BATCH MIXERS, 12 TO 75 CU. FT



PALLET CLEANERS AND OILERS



PUMPING UNITS



AUTOMATIC BLOCK SPLITTER

FEED DRAWER AGITATORS

POWER ROLLAWAYS

SKIP HOISTS

STANDARD AND SPECIAL MOLDS

Columbia WORLDWIDE ACCEPTANCE in just 10 years!

FRED NETH, President

It isn't easy for an industry to achieve world-wide recognition in the space of one decade — but Columbia Machine has done it! In 1945 Columbia produced its first machine. Today orders for Columbia's products flow in from every part of the globe. Continuous product development has contributed to Columbia's rapid expansion. Final credit, however, must go to Columbia's staff, whose loyalty and cooperation spell the true history of Columbia's bright success. Today — with ten rewarding years behind them—Columbia's people are determined that their company will continue to grow in all the ways by which a vigorous, progressive industry is measured:

MANAGEMENT, with foresight to plan a better product and better ways of serving the concrete products industry.

SALES PERSONNEL, many of whom have grown up in the block business; men who know their wares, who know production problems, and who are qualified to help you with yours.

A SERVICE ORGANIZATION trained in our own plant and competent to service any Columbia machine, anywhere.

AN ENGINEERING AND TESTING DEPARTMENT, constantly at work to give you machines and equipment which top the field for quality and quantity of output.

Columbia's people — like the great machines they make and sell — are always out in front. Plan to meet these men who are making industrial history at the NCMA convention in New Orleans, January 23 through January 26.

District Offices in: Wisconsin, Illinois, South Carolina, Mississippi, Florida, New Jersey, Virginia, California, Massachusetts, Montreal, Quebec, and Vancouver, B. C.

Columbia MACHINE

Home Office: 107 S. GRAND, VANCOUVER, WASHINGTON
Factory Branch and Warehouse: Mattoon, Illinois

Frequently Encountered Questions and Answers On Concrete Products

These queries on concrete masonry were prepared by Canada Limited and distributed by the National (Canadian) Concrete Products Association.

1. How can concrete be kept clean, and free from stains?

Much of the dirt and soot that accumulates on the exterior surface of concrete masonry walls can be removed by plain water. Interior surfaces can be dry-cleaned with a brush or a vacuum cleaner, or with a foaming-type detergent mixed with water, applied with a brush or a sponge. Use as little water as possible, and remove the foam when dry with a dry brush or a vacuum cleaner.

Iron stains can be removed with a mixture of sodium citrate and glycerin, or with sodium hydrosulphite, in the case of deep stains. Copper, bronze, and aluminum stains can be removed by using a mixture of ammonium chloride and powdered talc.

2. What precautions should be taken against cracking in laying block and concrete brick walls?

Control joints should be used in long walls. These allow for the natural volume changes in materials, due to temperature changes. Your concrete products manufacturer can help you space these control joints properly.

Horizontal reinforcement is also recommended, to provide stability in the wall. Again, the concrete products manufacturer will advise you how much reinforcement you will need. Reinforcement under large windows, and flashing under sills also help to prevent hairline cracks.

3. Is exposed interior concrete masonry cold and damp?

The "cores" or air spaces in concrete block help to provide a natural insulation for the structure, keeping it warmer in winter and cooler in summer. Interior walls can be painted in warm colours that create an atmosphere of warmth. Cement base paints help keep moisture out, so that walls will remain dry.

4. What treatment should be given concrete block basement walls to make them moisture proof?

One such treatment is to apply cement plaster not less than ½ in. thick in two coats to the outside of the wall. Start it just below the ground line and continue down the wall and across the ledge formed by the projection of the footing. In wet soils an additional coat of asphalt is advised. In dense soils such as clay or shale, a drain tile should be laid around the footing.

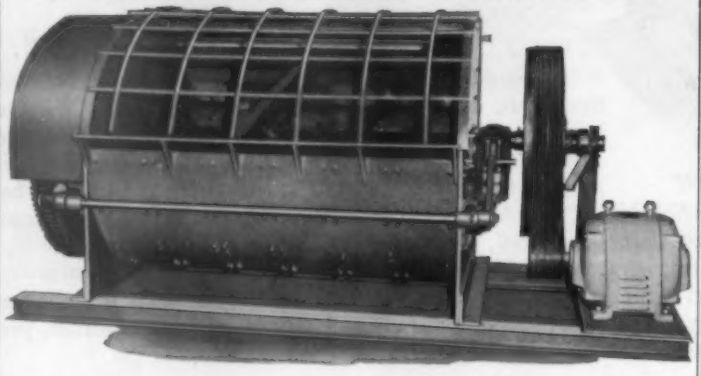
5. What use can be made of concrete products to improve an existing home, and to help sell new homes?

The home owner can add a colored terrace or patio, an outdoor barbecue, a garden wall, a swimming pool, a garage, or a breezeway. He can do much with precast steps and curbing. Gateposts can be built of concrete block, with a precast top. Many other improvements can be made at low cost to add in attractiveness to existing homes, and to give home builders a selling edge when prospects examine the house.

The Frederick, Md., plant of the M. J. Grove Lime Company recently received a National Ready Mixed Concrete Association Safety Achievement Award for 1955. The award was bestowed upon the Frederick plant for achieving 38,000 man-hours without a single accident involving its truck fleet, causing lost-time, personal injury or major property damage.

12 Cubic Foot to 75 Cubic Foot

KENT BATCH MIXERS



This large capacity mixer combines features that assure safe, convenient operation and large output of thoroughly mixed concrete *economically.*

Gearing is precision cut. Motor, positive action clutch, belts and bearings are specially designed for heavy duty. Motor and bearings are sealed to exclude dust and grit.

Mixing blades are a superior quality of cast steel. Liners are of sectional type cast from NI-HARD metal, in the larger size mixers. They will render exceptionally long service and may then be replaced easily.

Write for information regarding the complete Kent line of Batch Mixers or Kent Continuous Mixers if interested in this type.

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N. C. M. A. Convention
New Orleans, La.
JAN. 22-23-24-25
HOTEL ROOSEVELT

The KENT MACHINE CO.
DIVISION OF THE LAMSON & SESSIONS CO.
CUYAHOGA FALLS, OHIO
CONCRETE PRODUCTS MACHINERY SINCE 1925
Canadian Distributor: Wettlaufer Equipment, Ltd., 49 Merton St., Toronto 12, Ontario

National Concrete Masonry Assn. Convention Program

Roosevelt Hotel, New Orleans, La., Jan. 23-25

MONDAY, JANUARY 23

Badge required for admittance to all sessions. Registration fee of $20 per person for non-members attending program sessions.

8:30—Registration—Main Entrance, Grand Ballroom

9:30—Music—Grand Ballroom—Jerry Edwards at the piano

10:00—Convention Opens—Grand Ballroom
Presiding—S. Carl Smithwick (Smithwick Concrete Products, Portland, Oregon), president, National Concrete Masonry Association
Invocation—Reverend A. M. Serex, Rayne Memorial Methodist Church
Welcoming Address—Hon. Victor H. Schiro, acting mayor of New Orleans
Treasurer's Report—Carroll Strohm Jr., secretary-treasurer, National Concrete Masonry Association
Election of Diretcors—A. G. Streblow, chairman, nominating committee

10:20—The President's Annual Report
General Remarks—S. Carl Smithwick, president
Engineering—R. E. Copeland, director of engineering
Promotion—William P. Markert, director of promotion
Washington Office—Theodore Leba Jr., manager, Washington office
Administrative and General Activities—E. W. Dienhart, executive secretary

12:00—"Effective Public Relations for the Small Producer"—Edgar Forio, vice-president, Coca-Cola Company, Atlanta, Ga.

12:30—Award—Early Bird Door Prize
Session adjourns

2:00—Session Opens—Grand Ballroom
Presiding—Max H. Miller, United Cement Products Company, Wichita, Kans.
"The Cement Shortage in the Block Industry—Fact or Fancy?"—William M. Avery, editor, CONCRETE Magazine

2:30—"An Approach to Meeting the Competition of Poured Basements"—Philip Paolella, Plasticrete Corporation, Hamden, Conn.

3:00—"The Significance of the Guaranteed Annual Wage Negotiations in 1955"—Lee C. Shaw, Seyfarth, Shaw & Fairweather, Chicago, Ill.

3:45—"Construction Outlook"—Thomas S. Holden, vice-chairman, F. W. Dodge Corporation, New York, N.Y.

4:15—Award—Early Bird Door Prize

9:00 to midnight—Mardi Gras Party—Grand Ballroom

TUESDAY, JANUARY 24

8:30—Registration—Main Entrance, Grand Ballroom

10:00—Session Opens—Grand Ballroom
Presiding—W. R. Ireland, Atlanta Aggregate Co., Inc., Atlanta, Ga.
Film—"People, Products and Progress: 1975"
This is a film produced by the Chamber of Commerce of the United States, predicting what life in America can be like by 1975.

10:30—Address—William R. Connors, 1st vice-president, Bricklayers, Masons and Plasterers International Union, Washington, D.C.

10:50—"N.C.M.A.'s Long-Range Research and Technical Program"—T. L. Goudvis, Concrete Masonry Corporation, Elyria, Ohio

11:15—Address—Clayton Rand, editor, author, speaker and columnist, Gulfport, Miss.

12:00—Award—Early Bird Door Prize

2:00—Session Opens—Grand Ballroom
Presiding—T. L. Goudvis, Concrete Masonry Corporation, Elyria, Ohio
"Regional Building Codes and Their Influence on the Technical Requirements of Concrete Masonry"—M. L. Clement, director, Southern Building Code Congress, Birmingham, Ala.

2:30—"Developing a Profitable Market for Prestressed Concrete Masonry Floors"—Carroll Strohm Jr., Nashville Breeko Block & Tile Co., Nashville, Tenn.

3:00—"Economic Considerations in the Selection of High Pressure Steam Curing Systems"—Cedric Willson, Texas Industries, Inc., Dallas, Tex.

3:30—Award—Early Bird Door Prize

3:45—"A Rational Approach to the Control of Cracking"—R. E. Copeland, Director of Engineering, N.C.M.A.

7:30 p.m. to Midnight—Annual Banquet—International Room

WEDNESDAY, JANUARY 25

8:30—Registration—Main Entrance, Grand Ballroom

10:00—Session Opens—Grand Ballroom
Presiding—Earl W. Peterson (Ideal Cement Stone Company, Omaha, Neb.), president-elect, National Concrete Masonry Association
N.C.M.A. Safety Contest Awards—Henry Quaritius, Nailable Cinder Block Corporation, New York, N.Y.

10:45—"Use of Fly Ash in Block Mixes"—Norman H. Whithey, technical consultant, Madison, Wis.

11:15—Panel—"Accelerated Drying Facilities, Methods and Costs"—Benjamin Wilk, moderator, Standard Building Products Co., Detroit, Mich.; Verne Frese, Layrite Concrete Products of Seattle, Inc., Seattle, Wash.; Ralph Reiner, Cleveland Builders Supply, Cleveland Ohio.

12:00—Award—Early Bird Door Prize
Meeting Adjourns

Facilities of E. L. Dauphinais, Inc., North Grafton, Mass., were extensively damaged by fire recently. Emile Dauphinais, owner stated that the blaze caused damage estimated at $40,000 to screening and washing equipment, but that the concrete mixing equipment had not been affected.

Officials of the Marietta Concrete Corporation at Marietta, Ohio, estimated that a fire which swept through one of the firm's buildings on December 17 caused damage amounting to at least $100,000, possibly $115,000. A short circuit was thought to be the cause of the fire. Production will be resumed as soon as repairs have been made.

New Ready-Mix Operations Opened in All Sections—Others Under Construction

New ready-mixed concrete plants began production recently in different sections of the United States, and many others are under construction.

George Bernadoff has announced opening the Red-E-Mix plant in Elko, Nev. He plans to add washed and screened sand and gravel to the concrete production.

In Vandalia, Mo., the Vandalia Concrete Product Company began production of ready-mixed concrete under the supervision of Don Smith, plant manager. The owner is W. B. Smith, of Montgomery City, Mo.

Meanwhile, at a cost of $150,000, Standard Industries, Inc., of Tulsa, Okla., began construction of its newest plant, in Catoosa, Okla., the first industrial site in that community.

The plant, which will have an estimated capacity of 400 to 500 cu. yd. of concrete daily, will cost an initial $75,000; and the additional equipment is expected to bring the total cost to approximately $150,000.

The C. W. Shirey Company, Waterloo, Iowa, has announced plans for the construction of a second ready-mix plant in Waterloo at a cost of about $50,000. More than 100 cu. yd. of ready-mix will be turned out each hour.

Henderson Hite, a contractor in Bardstown, Ky., has opened a ready-mixed concrete plant in that city. He also operates a plant in Elizabethtown, Ky.

Enfield, Conn., will be the site of the Manchester Sand and Gravel Company's latest concrete batching plant, according to William Thornton, president.

In full production, at 1,000 cu. yd. per day, is the new concrete mixing plant of Concrete Materials, Inc., in Marion, Ind. Cement will be supplied by the parent organization, the Old Fort Supply Company of Fort Wayne, Ind.

Second DeMarco Facility Opened in Pompano Beach

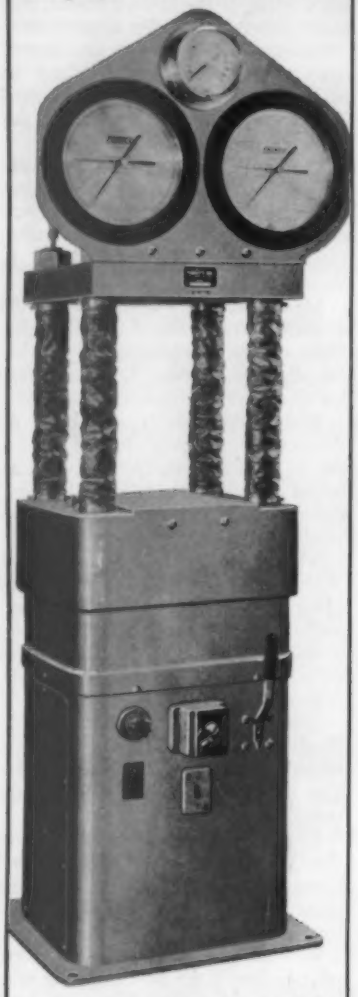
A $200,000 concrete block plant at Pompano Beach, Fla., was opened recently by the DeMarco Concrete Block Company, according to J. A. DeMarco, president.

Equipped with the latest machinery for production, dust control, and operating efficiency, the plant is located on a 10-acre tract and is the first of its kind in Pompano Beach.

Henry Blaikie, who has been associated with the DeMarco Company's Birmingham, Ala., plant, manages the new operation.

FORNEY

Compression & Flexure Testers



WHY SHOW YOUR CUSTOMERS AND PROSPECTS TEST REPORTS WHEN IT'S SO EASY TO SHOW THEM ACTUAL TESTS?

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Fifth Annual A.C.P.A. Short Course Attracts U.S., Canadian Producers

The fifth annual Short Course School of Instruction of the American Concrete Pipe Association held at the Chase Hotel in St. Louis, Mo., November 14, 15, and 16, 1955, was successful beyond expectations. At least 170 persons from 78 companies in 29 states and three provinces of Canada registered for the three-day meeting. More than 100 were in attendance for an informal evening session on the second day.

The sessions were opened by A. W. G. Clark, who is serving his second term of office as the president of A.C.P.A. The course of instruction was outlined by John G. Hendrickson Jr., research engineer of the Association. He was followed by H. G. Curtis, head of the Canals and Pipelines Section of the Bureau of Reclamation, who presented a paper on specifications.

Dr. A. T. Goldbeck, director of the Bureau of Engineering of the National Crushed Stone Association, was introduced by E. F. Bespalow, vice-president of A.C.P.A. Dr. Goldbeck discussed the properties of crushed stone aggregates and showed and described devices for testing rocks. These included an abrasion test machine, a hardness machine, and an impact testing machine. He also discussed the soundness of aggregates as measured by a sodium sulphate immersion test, and covered the subject of reactive aggregates. He stated that proper gradation of materials will save the pipe manufacturer money and also reduce absorption.

Herman G. Protze, materials technologist, Boston, Mass., discussed some of the homelier aspects of concrete pipe manufacturing. Anthony J. Reto, field engineer, the Hamilton Kent Manufacturing Company, described the characteristics of rubber used as gasket material in concrete pipe lines. His address was followed by a motion picture entitled *The Builders*, produced by the Wire Reinforcement Institute.

Edward M. Brickett, Hume Pipe of New England, Inc., opened the sessions of the second day by presenting an address on the design of concrete mixes and demonstrations of basic calculations of yield and batch weights. He described the relative sizes of sieve openings used to determine the gradation of sands and aggregates and prepared sample computations of aggregate gradations and fineness moduli.

K. E. Logan, General Material Company, St. Louis, described a plastic compound used in bonding new concrete to old. In the concrete pipe field it has particular application in joining laterals to mains and in effecting small repairs.

Major effects of calcium chloride in concrete construction and the use of this material in steam-cured concrete were reviewed by M. C. Adams, field engineer, Calcium Chloride Institute. He stated that the prime reasons for the use of CaCl in concrete construction are to obtain early strength and to protect the mix in cold weather. He reported the results of tests made in England which indicate that the use of CaCl increases the strength of steam-cured concrete.

Thomas K. Breitfuss, assistant to the managing director, A.C.P.A., discussed some phases of combatting sales promotion of competing industries. The information he presented was supplemented by pictures of defective competing installations. A discussion of the fallacies in some of the promotion of competitors followed.

Substituting for H. C. Eames, New England Concrete Pipe Corporation, Mr. Protze presented a paper prepared by the former on the testing of cores cut from the wall of concrete pipe to determine the compressive strength of the concrete.

Thomas L. Gaukel, Social Security Administration, spoke on the vital topic, *Your Social Security*, and described the scope of the program, how it is handled, and what benefits the individual obtains from it.

An informal evening session and the third day of the school were devoted to manufacturing and promotional problems. Moderator of the morning panel was E. F. Bespalow, Choctaw, Inc., Memphis, Tenn. Topics covered included permissible cracks in pipe, forming curved lines with straight pipe, elliptically reinforced pipe, jacking pipe, fly ash in pipe, and related subjects.

The second panel was moderated by Carl A. Bluedorn, Zeidler Concrete Products Machinery Company, Waterloo, Iowa. Arch pipe sections, gasket materials, A.S.T.M. specifications, and tests were discussed.

Eastern Firm Doubles Output With Addition Of New Machine

A $45,000, 15½-ton concrete block and brick making machine was recently installed in the American Block and Supply Company plant in Frackville, Pa. Owners of the plant are Mitchell Dziczek and Julian Gulbinski.

The machine will turn out concrete blocks and bricks at the rate of 800 per hour, in 4-, 8-, and 12-in. sizes, and will double the plant's former capacity.

Mid-States Concrete Products Wins 1955 Industry "Joshua"

George Harker of the Mid-States Concrete Products Company of Beloit, Wis., recently received the American Match Industry "Joshua" award for the most distinguished use of matchbook advertising by a concrete products manufacturer during the last year. Ray H. Weisbrod, executive vice-president of the Milwaukee Association of Commerce, made the presentation at a luncheon ceremony honoring all Wisconsin "Joshua" winners in the 46 industries receiving such awards.

The Mid-States matchbooks were selected by a panel of 15 advertising and marketing experts for a chart showing load bearings of 14 different lengths of Flexicore precast concrete slabs produced by this company.

American Block Machine Aids Greek Quake Victims

Residents of the off-shore islands of Greece who were made homeless by the earthquakes of 1953 now have a prospect of adequate shelter. The Greek Ministry of Public Works recently ordered a Vibrapac block machine to produce concrete block for new homes.

Many of the 93,000 homeless persons now are living in tents and other temporary shelters.

Frederick W. Reinhold, president of Anchor Concrete Products, Inc., Buffalo, has been elected vice-president of the New York State Division of the American Cancer Society. Mr. Reinhold has been active in the Erie County Chapter of the American Cancer Society since 1947.

Pocono Fabricators, Inc., a subsidiary of Patterson-Kelly Company, Inc., East Stroudsburg, Pa., is now producing cement in a variety of pastel shades. Known as Pre-Krete, it was first developed in green as a refinishing liner for the inside of rusted water tanks.

With a C & W Electronic Moisture Meter you may now measure the moisture content of your sand

INSTANTLY!

ACCURATELY!

ECONOMICALLY!

YES — Its Operation Is Instantaneous
Its Readings Are Extremely Accurate
Its As Economical to Operate as a 100-Watt Light Bulb
Its Low Initial Cost Makes It Possible for Every Batch Plant to Have the Advantage of the Use of the New, Improved, C & W Electronic Moisture Meter.

Eliminate those "too wet" loads that leave your plant before your batch operator knows that there has been a moisture change.

Eliminate the time and money wasted adding water at the job site and then remixing a load on expensive truck time if the batch is too dry.

Take the guess work out of making your concrete and really have control of your slump.

Install a C & W Electronic Moisture Meter in your plant and save both time and money.

Complete with installation instructions, only $569.00 F.O.B. San Francisco.

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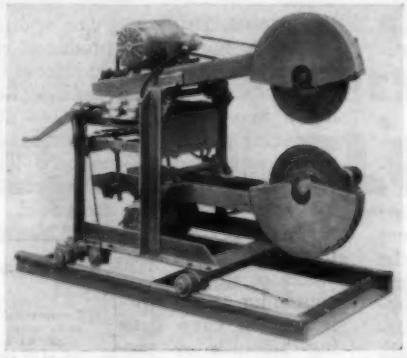

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cuts any concrete product

these 2 heads cut costs

• Laugh at your cutting problems with *PreCaster's* amazing 2-in-1 saw that makes complete *cut in one pass* . . . steel re-enforced concrete slabs . . . plain concrete slabs . . . concrete block, pipe, brick, tile.

• *PreCaster's amazing 2-in-1 Concrete Saw* cuts costs, time, labor, hazards, worry, blade wear and breakage.

• *Completely waterproof for outdoor operation.*

• *Blades:* thinner, smaller, more economical . . . because they cut from both sides . . . *up to 150 cuts per blade on steel re-enforced 8" x 16" slabs.*

• *Motors:* standard model is equipped with two 5 HP 3 phase motors . . . 220-440 volts. Can be wired for your individual requirements.

• Write for catalog, prices, and new *Seven Profit Opportunity* brochure.

PreCaster Inc. • 5217 Beech Street • Cincinnati 17, Ohio

Rx Ready Mix

By Harry F. Thomson

Verify Quality of Fly Ash Before Using

IN RECENT years there have been frequent references in trade and technical magazines to the term "fly ash," as if it were a well-known household name. Some readers have thought of it as soot, which it is *not*; soot is principally carbon, and fly ash is principally silica.

Associated terms which are baffling to many readers are "pozzolan" and "pozzolanic." One may hear the statement that most fly ashes are excellent pozzolans. A fair question is "What is the connection of these materials with concrete?" The simple answer is "When suitable pozzolans, including fly ashes, are added to a mix, they improve the properties of the concrete, and some may reduce the cost of materials in a mix considerably."

Pozzolans[1] have been described as siliceous materials, natural or artificial, which although not cementitious in themselves, contain constituents that will combine with lime in the presence of water to form compounds possessing cementing properties. In short, a pozzolan added to a concrete mix combines with the lime freed by the hydration of the cement to contribute to the strength of the hardened concrete. And further, any siliceous material having that property is termed pozzolanic. Among materials classed as pozzolans are certain grades of fly ash. Fly ashes exhibit pozzolanic properties in varying degree and therefore are all classed as pozzolans.

Some of the effects of adding a suitable pozzolan to concrete are as follows: better workability, less generation of heat, less water demand, lower permeability, reduced expansion from the reaction between high alkali cement and certain aggregates, and contribution to the ultimate strength of the concrete. The extent of these benefits varies greatly with different materials of either natural or artificial origin.

Fly ash is an artificial pozzolan. It is a residue from the burning of powdered coal; as it is exceedingly fine (its specific surface is usually greater than that of portland cement) it is normally discharged through the stack of a coal-burning power plant, along with the flue gases. But it can be trapped by mechanical means, usually an electric precipitator. The normal sources of supply include the large coal-burning electric generating plants which have installed precipitators in order to reduce smoke nuisance. Industrial boiler plants which burn powdered coal also produce fly ash, but they may not be equipped to collect it. The recovered dry fly ash is usually stored and handled in bulk, either in covered-hopper cars or tank trucks. A number of producers of fly ash, whose sales volume justifies it, have installed bagging facilities. Being a by-product, its value at the producing plant is low, as compared to a manufactured product like cement. It has various industrial uses aside from the concrete field.

Fly ash consists principally of the oxides of silicon, aluminum, and iron, with varying amounts of carbon. The silicon is in amorphous, not crystalline, form. The carbon content is commonly regarded as one of the criteria for use in concrete. Many specifications place a limit of 12 percent for the loss on ignition, but a large number of the good ashes show a considerably lower value.

The properties of fly ash which are of special importance to concrete are:

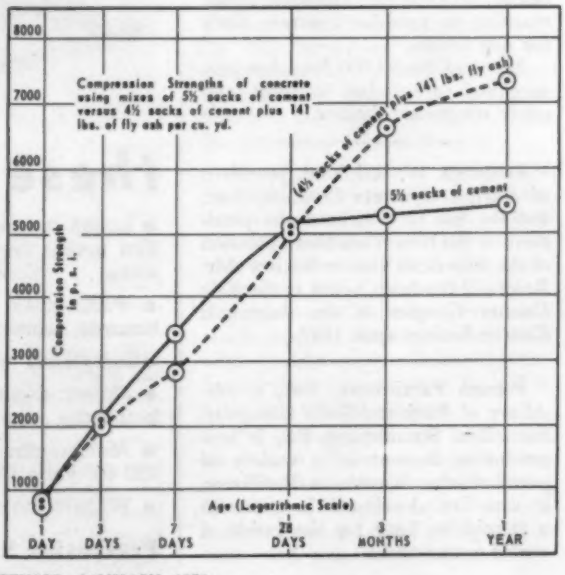
Fineness—As the particles are very fine and almost spherical (they are cooled pellets of molten glass), the addition of fly ash increases the workability of concrete, especially lean or harsh mixes, as it simulates roller bearings between particles of aggregate. In fact, fly ash was introduced to the ready-mix industry as an admixture for improving workability.

Pozzolanic activity—Fly ash possesses the feature mentioned above for all pozzolans, namely that the silica combines with the lime liberated by the hydration of cement to form cementitious compounds, and thereby contributes to the strength of the concrete. This reaction varies with different ashes, but takes place slowly and over a long period.

Alkali—aggregate reaction—The silica in certain fly ashes will effectively control the undesirable expansion when reactive aggregates and high- alkali cement are used.

When it is intended to utilize the fine-particle character of fly ash to improve workability, *i.e.*, as an admix to the regular proportions of the concrete, the quantity added is relatively small, usually about 4 lb. per sack of cement. This is too low for any pozzolanic action to add to the strength importantly. Material for such purpose should comply with the standard specification entitled Fly Ash for Use as an Admixture in Portland Cement Concrete, A.S.T.M. Designation C350-54T. This specification covers chemical and physical requirements, and provides that sampling and testing shall be in ac-

(*Continued on page* 293)



[1]This type of material is not to be confused with an entirely different proprietary product bearing a trade name which is spelled somewhat similarly.

Trade Notes

Donald R. Shaffer, formerly manager of the Long Island City, N. Y., office of the Hyster Company, is now

D. R. Shaffer

Harold R. Lucas

district manager of the north central district of the Eastern Industrial Truck Division. Mr. Shaffer works with five Hyster dealerships in eastern and central New York, western Pennsylvania, eastern Ohio, most of West Virginia, and eastern Canada. Mr. Shaffer joined the sales promotion department of the Hyster Company in 1948.

Harold R. Lucas has been promoted to the position of manager of a new merchandise division of the General Sales Department of the Hyster Company, according to an announcement released by Philip Hill, Hyster vice-president in charge of sales. Mr. Lucas has been administrative assistant in the General Sales Department for six years.

Concrete Transport Mixer Company, St. Louis, Mo., has appointed R. A. Young & Son as distributor for its Rocket revolving drum and Hi-Lo stationary drum truck-mixers.

The newly-appointed distributor, with sales offices in Fort Smith and Little Rock, Ark., will serve all of Arkansas except the extreme northeastern sector, which is covered by Memphis Truck Equipment Company, Memphis, Tenn.

Clair Taylor has been appointed Spray-O-Bond Company sales representative for the lower peninsula of Michigan and Lucas County in Ohio, according to R. F. Forrer, president.

A fire caused by defective wiring destroyed the building used for producing ready-mixed concrete in the plant owned by R. R. Provence, of Wichita, Kans. The loss was estimated at $3,000.

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BUY EFCO STEEL FORMS

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Lifetime steel faces never need replacing

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Easy to handle and assemble

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Save time, material, money

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Low original cost

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Other forms available on a rental basis

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DISTRICT SALES OFFICES: St. Louis, Mo. • Kansas City, Mo. Lincoln, Nebr. • Minneapolis, Minn. • Ft. Wayne, Ind. • Milwaukee, Wisc. • Cincinnati, Ohio • Cleveland, Ohio Metuchen, N. J. • Rochester, N. Y. • Springfield, Mass. • Washington, D. C. • Decatur, Ga. • Dallas, Texas • Los Angeles, Calif. • Oakland, Calif. • Denver, Colo.

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LITH-I-BLOCK

It's coming — the Lith-I-Block Machine with Rota-posed agitation, optional Hydraulic or Pneumatic operation, more Power, faster Production!

WATCH FOR IT—IT'S THE MACHINE YOU ASKED US TO BUILD

IF YOU CAN'T MAKE IT TO THE N.C.M.A. CONVENTION JAN. 23-25 IN NEW ORLEANS SEND US YOUR NAME AND WE'LL SEE THAT YOU GET FULL LITERATURE.

LITH-I-BAR COMPANY • HOLLAND, MICHIGAN

J. C. Fountain, president, Texas Concrete Masonry Association, who welcomed the visitors from 30 states to the meeting.

Southeastern, Texas Block Makers Hold Joint Session

Texas brand hospitality enjoyed by concrete masonry producers

By ROY L. PECK

Another ON THE SPOT Report

THE 12th annual meeting of the southeastern group of the National Masonry Association, held in co-operation with the Texas Concrete Masonry Association, at the Shamrock-Hilton Hotel, Houston, Tex., on November 21 to 23, 1955, introduced many of those attending to typical Texas hospitality. Planners for the 3-day event had scheduled business discussions in the mornings, allowing the 250 visitors an opportunity to enjoy the various recreational aspects of the Texas metropolis in the three afternoons and evenings.

Block producers, material men, and others interested in the combined character of the meeting, came from 30 states. This representative attendance attested to the national interest in the informative program prepared, which included a dozen or more prominent speakers and symposium discussions on subjects pertinent to the industry at this time. Subjects discussed included sectional reports from members on current and future business conditions; economic trends; an interesting recital of the effects of the atomic blast at Yucca Flats, Nev.; N.C.M.A. plans for technical research; effects of pozzolanic materials in concrete masonry; a symposium on methods of curing; current credit practices; and promotion plans of the Portland Cement Association and N.C.M.A. Many members utilized the week-end immediately preceding the meeting to discuss mutual problems with other "early bird" arrivals.

On Monday afternoon, after the luncheon at which Bill Daniel, of Liberty, Tex., valiantly expounded the merits of his state, most of the group took the bus trip to inspect the famous San Jacinto memorial monument and museum. That evening a cocktail party and dinner at the San Jacinto Inn offered the gourmands an opportunity to test their gastronomic capacities. On Tuesday afternoon time was made available for many producers to inspect the local plants of the Houston blockmakers.

At the initial business session on Monday, presided over by George W. Katterjohn, president of Katterjohn Concrete Products Company, Paducah, Ky., and president of the Southeastern group, the invocation was given by the Rt. Rev. Clinton S. Quin, Bishop, Diocese of Texas, Houston. Dr. William V. Houston, president, Rice Institute, Houston, extended a sincere welcome to Houston.

James C. Fountain, Greggton, Tex., president of the Texas C.M.A., welcomed the visitors to the state. Mr. Fountain reviewed the phenomenal growth of the concrete masonry industry in Texas during the last decade. He attributed much of this expansion to the availability of lightweight aggregates in the state, and to the knowledge which the younger, more modern-minded producers had acquired of advanced methods of curing. Although there was only one plant in the state using high-pressure-steam curing six months ago, Mr. Fountain expressed the belief that there would be at least a dozen such plants within the next half year. He credited the local association with achieving unusual harmony among competitive operations, a feat unmatched in any other state group which produced 400,000,000 units annually.

Mr. Katterjohn called on members in the audience representing a cross-section of the industry in the South,

The Shamrock-Hilton Hotel, Houston, Tex., scene of the combined Southeastern and Texas meeting.

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who reported on current and future business conditions in their respective areas. Glenn C. Barnes, operating plants in Phoenix, Ariz., and Warners, N. Y., said that he had experienced no recession in business in either area.

Harold Spaight, Cedar Rapids, Ia., reported good conditions for the last two years and felt that business would be even better in the coming year. He pointed out that there seemed to be a trend in the industry toward a greater use of color in blocks and patio tile. He added that a greater portion of his output had gone into commercial and industrial structures than in previous years.

Vernon Cole, Waco, Tex., found that his last year's volume was slightly less than in the previous period. John E. Kelly, Kinston, N. C., reported conditions there as excellent, giving full credit to the activity of the Washington, D. C., office of N.C.M.A. for helping his firm get several large orders for block in military buildings in the vicinity.

Phil J. Lala, New Orleans, La., said that there was plenty of residential construction in masonry in his area, despite the fact that lumber largely predominates there. He referred to the New Orleans Parade of Homes as an excellent business project. In this exhibit, 42 houses built of concrete blocks were inspected by some 1,200 persons on the opening day.

Fred Reinhold, Buffalo, N. Y., told of attending the National Building Executive Conference, held in Washington, D. C., recently. Statistics presented at this meeting showed that a $50,000,000,000 construction volume might be reached in 1955, representing a 4 percent increase over 1954. It was estimated that over 10 percent of this total volume was in concrete products, and it was expected that this percentage would at least continue, if not increase, in the future.

R. C. (Dick) Page, Lexington, Ky., reported that lightweight block business had decreased 20 percent in eastern Kentucky, due (in his opinion) to the trend toward "do-it-yourself" construction by farmers using hand production. He said that 20 new homes of "slip-block" types received special attention in the Kentucky Parade of Homes.

Otto Buehner, Salt Lake City, Utah, stated that he believes concrete masonry deserves to get 40 percent of the overall construction volume. He feels that a concrete block wall must not have a heat loss of coefficient of over .24 if it is to compete successfully with other types of wall. Mr. Buehner said that his company had 20 percent more business this year than last, a good portion of this going into industrial and school use.

Dale Cobb, Jackson, Miss., expressed confidence in excellent future business, although he declared that his area had experienced all the problems that others face. In the Jackson Parade of Homes half of all the houses had concrete masonry walls. One house, of all-masonry construction, has been awarded the second prize by the rating judges.

C. W. Zimmerman, Lakeland, Fla., reported that in the central part of that state the greatest increase in 1955 had been in residential work, but that this volume had slowed up recently, due, he felt, to the tightening in F.H.A. and V.A. financing.

Ed. C. Burris, executive vice-president, Texas Manufacturers Association, spoke on economic trends of the South.

Following these sectional reports, Ed C. Burris, executive vice-president, Texas Manufacturers Association, was introduced by Mr. Fountain. Mr. Burris is the executive head of an organization of 3,000 members which was largely responsible for the tremendous growth of manufacturing in the state. He presented statistics on the South which afford some interesting comparisons.

He stated that until after World War I no industry of any consequence developed to change the typically agricultural pursuits in the South. It was the return to the South of many persons from the industrial North and East, who had spent some time during the war in the South, that had initiated the industrial expansion. Similarly, at the approach of World War II, a further impetus to the growth of Southern industry had been afforded by decentralization, governmental spending, and a liking for Southern labor and climate.

A group of producers at the luncheon includes (left to right) R. A. Probert, Forest Park, Ill.; George Oswalt, Forest Park, Ill.; Cliff L. Hodgert, Mesa, Ariz.; Otto Buehner, Salt Lake City, Utah; Glenn Barnes, Mesa, Ariz.; Henry O. Pommer, Memphis, Tenn.; R. F. Leftwich, Bronxville, N.Y.

Wolf G. Bauer, consulting engineer, Seattle, Wash., who discussed the effect of pozzolanic materials in the manufacture of concrete masonry units.

In the years following the war industry built branch plants, utilized the natural resources of the area, and still further contributed to industrialization. Typical of such expansions are those noted in the petroleum, chemical, aircraft, paper and pulp, and transportation equipment manufacturing industries.

Mr. Burris cited some significant figures to show how the loss in one of the three basic sources of creative wealth—agriculture—has been far overbalanced by the gains made in the remaining two—mining and manufacturing—over the last 14 years in the South:

Data on Southern States (1940-1954)

Item Compared	1940	1954	Increase or Decrease
Population	45,000,000	54,000,000	9,000,000
Number of Farms	3,254,000	2,863,000	391,000
Mining Employees	389,000	433,000	44,000
Manufacturing Employees	2,403,000	3,680,000	1,277,000
Life Insurance	$24.8 billion	$78.5 billion	$53.7 billion
Bank Deposits	$11.1 "	$42.7 "	$31.6 "

Each additional job established in any of these three basic industries, declared Mr. Burris, provides a livelihood for ten people. From the above data it is shown that industry in the new South would thus maintain 13,210,000 additional persons. Housing this additional population would require a great building program. Mr. Burris quoted other figures showing that the backlog of contemplated industrial construction in the South on January 1, 1955, was $5,474,000,000, or nearly 50 percent of the planned total for the entire nation. The total backlog of construction on the same date for the South was $24,064,000,000, or one-third of the entire country's scheduled construction.

Whether or not this construction materializes, will depend upon whether there is retained in the southern states a favorable attitude of the government and public with respect to the invested dollar. Mr. Burris expressed doubt that these conditions will be retained unless everyone works toward the correction of the many abuses now existing in government practices.

In the concluding paper of Monday's session Cedric Willson, Texas Industries, Inc., Fort Worth, Tex., chairman of the Technical Problems Committee of the Expanded Shale, Clay and Slate Institute, presented salient facts on the effects of the atomic blast of May 5 at Yucca Flats, Nev. He illustrated his talk with sections of official films showing the effects of the explosion on the series of test houses built at various distances from "ground zero," the point of explosion. For the work done in preparing these test houses, he paid tribute to the following: Jack Streblow, Basalt Rock Company; E. A. Peterson, Rocklite Products Company; A. R. McVoy, Texas Industries, Inc.; and others who represented the companies sponsoring the concrete masonry test houses. Mr. Willson, a project consultant on the test, proved an able speaker in pointing out to his interested audience the special phases of the test program.

At the luncheon which followed, Bill Daniel, a rancher, lawyer, churchman, and legislator of repute, made a dramatic appeal to all to work against more concentration of power in Washington, D. C., an increasing threat to all citizens. He felt that most individuals and groups who lobby for federal funds often forget that the only source of government income is taxes, a burden which must be reduced if industrial progress is to continue.

The first paper to be presented at the resumption of the business session Tuesday morning was presented by R. E. Copeland, director of engineering, N.C.M.A., Chicago, Ill. Mr. Copeland fully discussed the plans of the Association for the proposed long-range engineering and technical research program, recently approved by the N.C.M.A. board of directors.

He outlined the efforts of several competitive industries, to make his audience realize the vital need for this work. To illustrate the size of the concrete masonry industry, he compared the 10,000,000-cu. yd. volume of concrete in the Hoover Dam—the world's largest man-made structure and one of the seven modern engineering wonders—as having only half the volume of concrete used each year by the whole concrete masonry industry. Such an industry, he declared, demands a well-conceived research plan for the future.

Mr. Copeland stated that the average manufacturing industry now spends 2 percent of its gross sales for research, whereas the concrete masonry industry has spent only .05 percent, or 1/40th of the average expenditure for research in the past. He cited several instances of competitive construction interests taking the initiative in creating research facilities; he declared that this trend must result in these industries reaping vast benefits unless the N.C.M.A. program is started at once.

He reviewed the history of the research program since initial studies several years ago indicated the need for it. Approximately 349 members of the association have voted on the

Cedric Willson (left), Texas Industries, Inc., being congratulated by George Katterjohn, Katterjohn Concrete Products, on a successful meeting.

Mary Hanson and Marlene Rohde, A. A. Wire Products Company, Chicago, Ill., look over the swimming pool at the Shamrock-Hilton Hotel.

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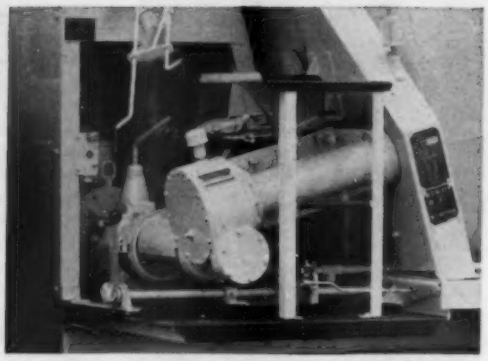

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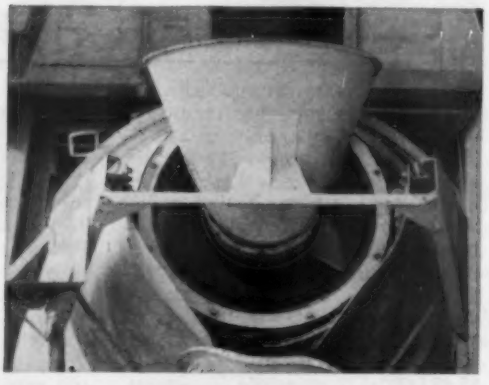

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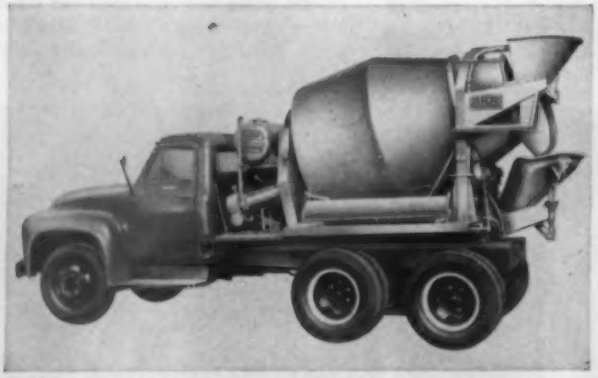

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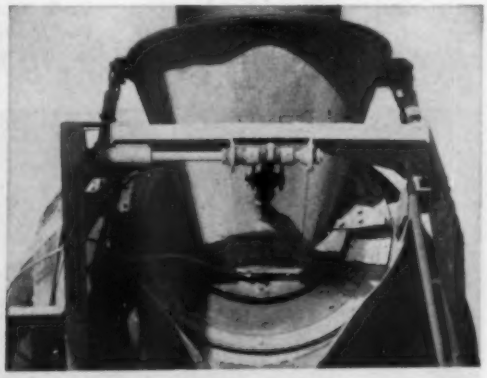

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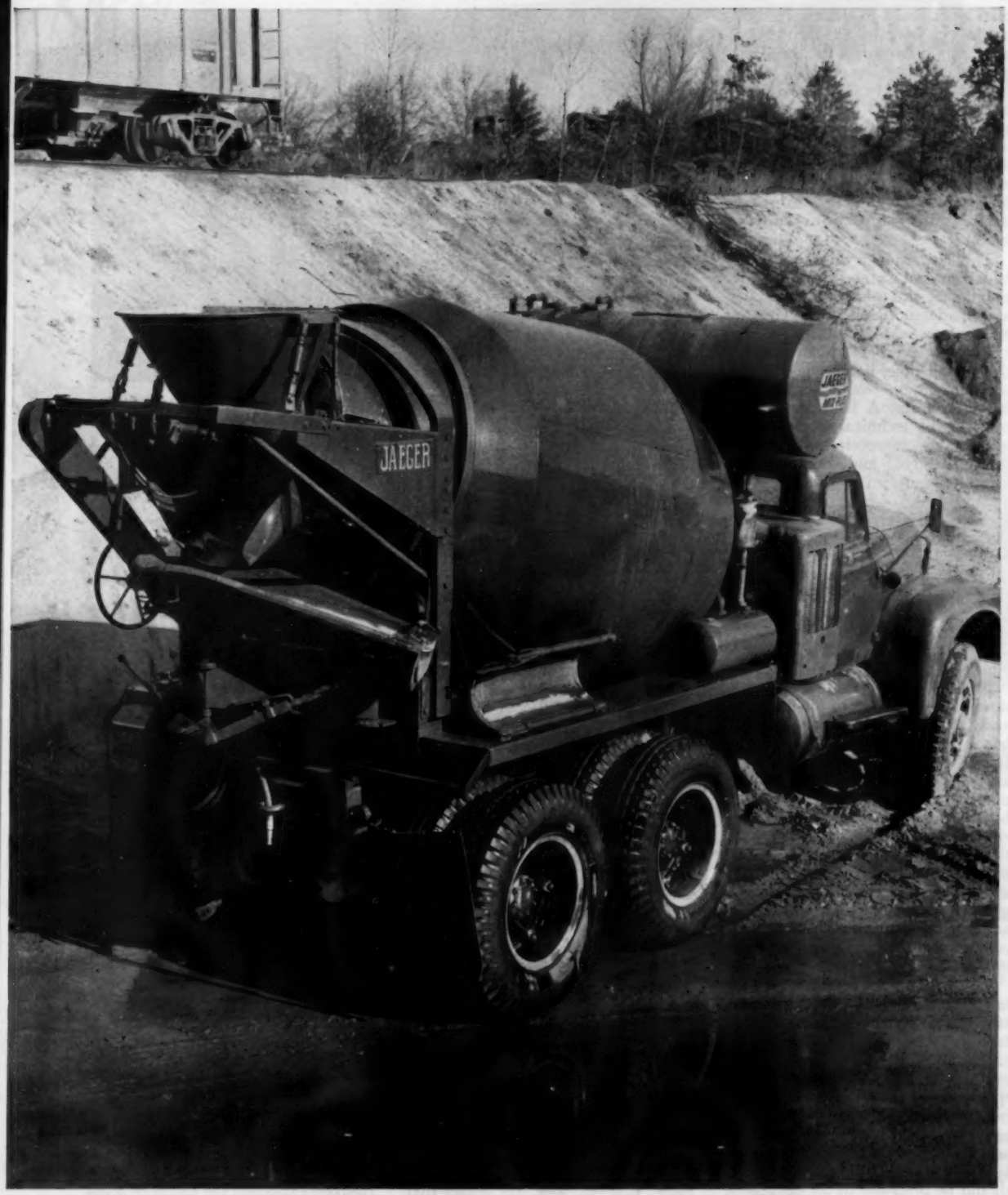

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plan as outlined to the entire membership in January, 1955, in a complete report prepared for the Technical Problems Committee. The primary objectives set forth in this plan are: (1) to solve urgent problems, such as cracking of concrete masonry walls; (2) to improve product quality; (3) to improve use performance; (4) to develop new uses and new products; and (5) to reduce manufacturing and construction costs.

The end result of this work would be wider public acceptance, better promotion, and sales work facilitated and made more effective. Greatest emphasis would be placed on the cracking problem, in an effort to lick this for all time, if possible. Technical information would be prepared in better form. A field engineering program of technical service, engineering, and promotion to members, state chapters, and other groups would be initiated. A wider acceptance and use of better manufacturing controls would be aimed at, to the end that product quality would be improved. The present technical staff would be expanded substantially, with the completion of the proposed technical research laboratory.

The board of directors of N.C.M.A. approved the program last July, with two stipulations: (1) that an additional letter be sent to all members, and (2) that the voting for the plan be at least as high as the return from the first announcement. Whereas some 89 percent had endorsed the plan at first, the second letter brought forth an approval of 97 percent of those making returns, and of these, 91 percent approved the program as submitted. Backed by this vote of approval, Mr. Copeland's office is taking immediate steps to activate the plan at once, as 69 percent of the returns to the questionnaire indicated this preference.

The Effect of Pozzolanic Materials in Concrete Masonry was the title of an unusually thought-stimulating talk by Wolf G. Bauer, consulting engineer, Seattle, Wash. Mr. Bauer explained his unbiased position in speaking on this subject, saying that he is interested only in obtaining proper materials for concrete blocks, and that any replacement of portland cement in the concrete mixture should be preceded by an exhaustive test of the materials proposed for such use. The term "pozzolan," he said, is a loose and singularly dangerous term to apply to all lime-reactive silicates, aluminates, or calcinates having a cementing action when used with portland cement.

Members of the symposium on curing (left to right): Rudolph C. Valore, Texas Industries, Inc., Fort Worth, Tex.; Henry Toennies, N.C.M.A., Chicago, Ill.; Cedric Willson, Texas Industries, Inc., Forth Worth, Tex.; Leonard Jones, Chandler Materials Company, Tulsa, Okla.; James Schwartz, National Brick & Supply Company, Washington, D.C.

He stated that he considered his discussion timely since we are now in the final stage of hydro-electric development in which pozzolanic materials first came to the front; that there are now five classes of portland cements in which pozzolan inclusions may be used as a chemical stabilizer or "buffer" to improve concretes; that the present period of high use of lightweight aggregates, many of which are essentially pozzolans, make it desirable to know more about possible pozzolan additions; and that the trend toward high-pressure-steam curing widens the field for use, since autoclaving is a natural development for pozzolans.

He pointed out that the investigation of any material felt to have attributes of value as a pozzolan should initially include a check as to its lime-reactive character. Most of the tests can be done with a laboratory pilot plant, and much information as to testing pozzolans is available in articles published over the last ten years. (The technical considerations in natural pozzolan production were covered in two articles by Mr. Bauer in PIT AND QUARRY, October and November, 1954.)

Mr. Bauer described one of several recent installations for preparing materials which he has made in concrete block production plants, that of the Atlas Building Products Company, El Paso, Tex. He stated that a detailed study of the scoria cinder pozzolan for several years preceded the erection of the drying-cooling-grinding-classifying-control unit in this plant. (See PIT AND QUARRY, December, 1955, pages 102 to 106, for a description of the fluidization unit used in this installation.) Some 3,000,000 blocks made of this aggregate have been produced at the Atlas plant. All of this production has shown a vastly reduced shrinkage, exceedingly high strength with normal low-pressure-steam curing, and a mix in which a high percentage of the portland cement had been replaced with finely ground pozzolan.

Stating that all pozzolans are different and that no one material meets one definition, Mr. Bauer warned his listeners that no data on pozzolanic materials tested to date can be made the basis for determining the characteristics of like materials under consideration. He expressed the hope that members of the industry would appreciate the opportunity offered by the use of pozzolanic materials to enhance the value of present-day portland cements, to help meet certain aggregate and cement deficiencies in some areas and for some applications, to make it possible for cement producers to supply fewer special types of cements. Such materials would also provide the industry with a means of saving cost and improving concrete which can only further the increased use of cement and engender confidence in concrete products and structures.

Cedric Willson was the moderator of a symposium on various methods of curing concrete blocks. Four speakers explained the merits of high-pressure-steam, one-phase and two-phase high-pressure-steam, and low-pressure-steam curing. The fundamentals of high-pressure curing were discussed by Rudolph C. Valore Jr., Texas Industries, Inc., Dallas, Tex. He first reviewed the process of cur-

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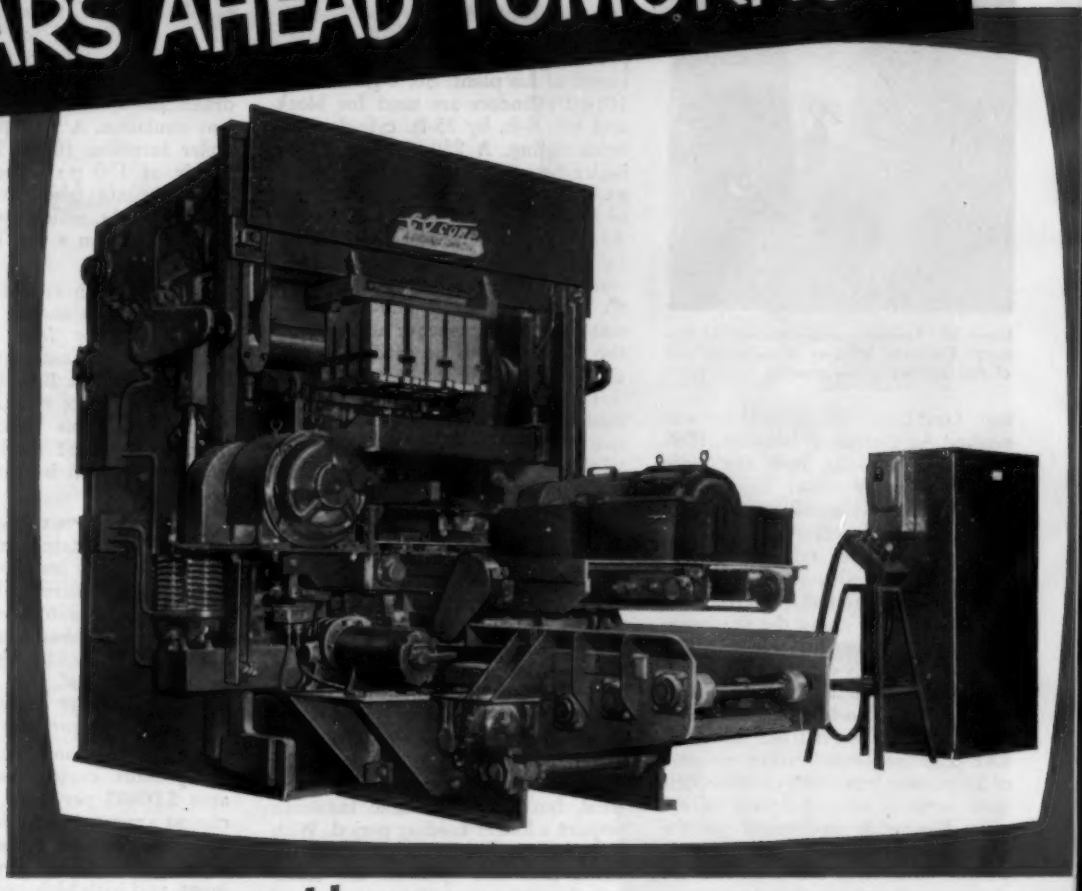

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Elmer W. Peterson, president-elect of National Concrete Masonry Association, one of the speakers at the meeting.

ing sand-lime brick, which was evolved in Germany between 1866 and 1880, showing how the basic principles apply today in modern block curing. He considers the work done by Carl Menzel most significant in explaining the relationship between lime and silica. This silica can be clay, slate, ground brick, etc., all finely divided to about the gradation of portland cement. He warned against too-highly-ground silica, stating that such grinding produces high strength, but also high shrinkage.

Mr. Valore pointed out that with high-pressure-steam curing a ratio of 20 percent lime to 60 percent portland cement, or a 1:3 mix of cement binders is economical (as the silica costs less than the cement), permits immediate shipment and less storage, and reduces shrinkage up to 85 percent of normal. He emphasized that it is temperature—not pressure—that does the work, but pointed out that the time-temperature relationship is an important element. At a holding temperature of 300 deg. F. six to seven times as much time is required for attainment of the same strength as at a temperature of 350 deg. F. He warned that any autoclaved product must be a formulated material to obtain best results.

James Schwartz, National Brick and Supply Company, Washington, D. C., revealed the details of one-phase high-pressure-steam curing followed at his plant. Six 8-ft. 1-in. by 101-ft. cylinders are used for block and two 6-ft. by 75-ft. cylinders for brick curing. A 250-hp. water tube boiler (equivalent to 500 hp. in capacity) furnishes steam at the rate of 8 lb. of steam per block cured. Aggregates are measured volumetically, using Type I regular portland cement and silica flour which has 95 percent passing 200-mesh. No water-dispersing agents are used as the blocks are to be as dry as possible.

The cycle of curing consists of loading block (72 per rack) from two machines into one autoclave until this is filled. One hour is used to build up steam pressure to 250 p.s.i., at which the autoclave is held for another five hours. Blowdown is done in 45 minutes (moisture 26 to 28 percent), and it takes a like period to unload the cylinders. Mr. Schwartz found that a 20-minute blow-down was too short, as it made the units too dry (12 to 15 percent), and that they drew moisture out of the mortar at the job.

Mr. Schwartz feels that the holding period would be the same for any of the three types of aggregates used, but that pozzolanic materials require a longer holding period. With one-phase curing at his plant one lift truck and one operator are eliminated, with a resultant saving of about $11,000 annually. Fully cured block is obtained for immediate handling, with less breakage. The saving is estimated at 0.8 cents per unit if silica flour is used. A disadvantage is that twice as many cylinders are required for one-phase curing as in pre-curing; or, in other words, the plant requires three more autoclaves, at a total cost of $93,000.

Leonard Jones, Chandler Materials Company, Tulsa, Okla., next furnished the details of that company's "two-phase" curing which has been followed for the last six months. Two 8-ft. 6-in. by 100-ft. autoclaves are used which have hydraulically-operated doors and excellent insulation. A 300-hp. water tube boiler furnishes 16,000 lb. of steam hourly at 150 p.s.i. Industrial cars on tracks are used throughout for moving blocks, which are loaded 480 (8-in.) units on a car, or 37,000 to each autoclave.

The operation consists of moving fresh block to a normal low-pressure curing kiln for four hours, then directly into the autoclaves for seven hours at 150 p.s.i. Blowdown of pressure at the end of this period is only 10 minutes. This rapid release of pressure and heat results in a very dry block, which is ready for delivery at once.

The advantages of two-phase curing, Mr. Jones stated, are that larger cylinders can be installed per dollar, less time is required, no pallets are taken into the autoclave; and more cycles per 24-hour period can be obtained. These, in his estimation, more than equal the disadvantage of requiring more steam capacity in two-phase high-pressure curing.

He offered some data on costs: low-pressure curing, he said, averages $.00483 per 8-in. unit; depreciation amounts to $.00437 per unit; with low-pressure curing, 27 to 28 units were obtained per sack of cement, and with high-pressure curing, 40 blocks per sack.

Henry Toennies, N.C.M.A. engineering staff, Chicago, Ill., discussed low-pressure-steam curing. The fundamental principles of such curing have been well known for many years and embody nothing new. This method is used for curing 90 percent of the blocks made today. It depends upon a fairly close control of time, temperature, and moisture, and varies as to strength requirements. Low-pressure-steam curing covers a temperature range up to 125 deg. F.; temperatures above that point are considered high-pressure.

The steaming-up period should not exceed 60 deg. F. per hour, depending upon the conditions in each case, and the heat should be uniform throughout the kiln. Loss of weight during curing means that drying is taking place. The drying period should not be counted on to add strength unless the blocks remain in the kiln. Any moisture above 50 percent in low-pressure curing will continue to add strength. It is recom-

E. W. Dienhart (left), executive secretary, and W. P. Markert, director of publicity, N.C.M.A., talk over plans for the New Orleans meeting with Earl W. Peterson, president-elect (center).

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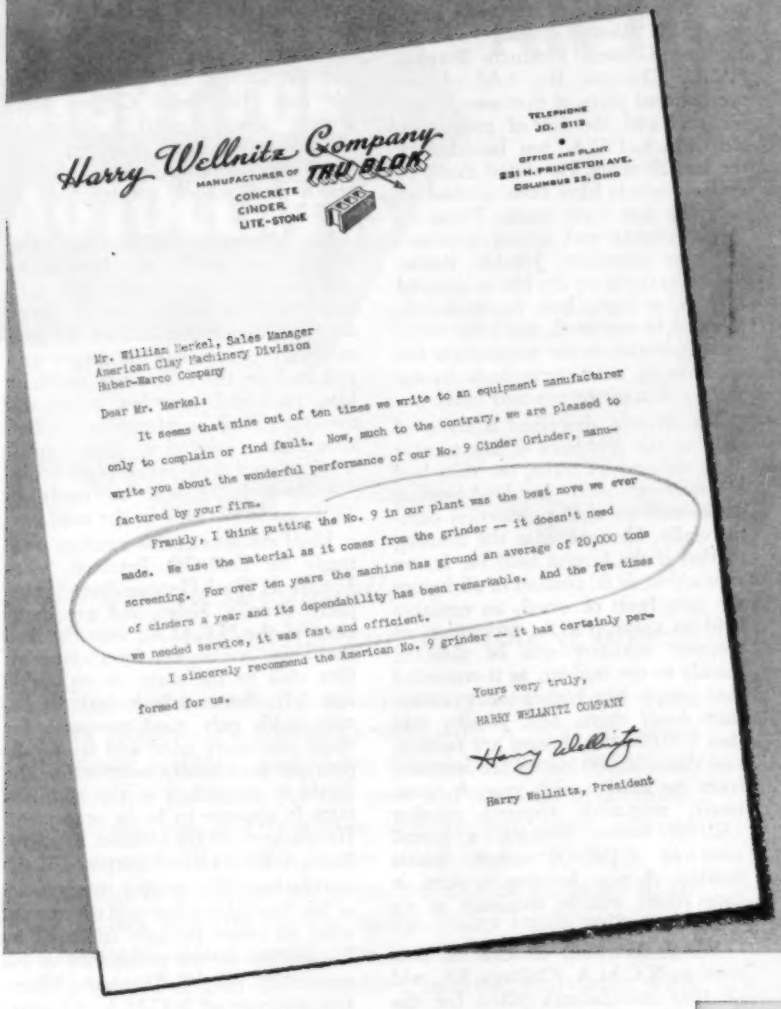

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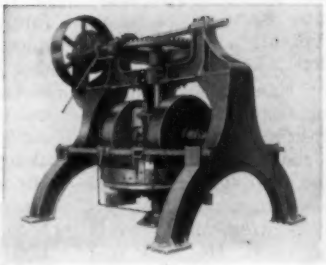
For grinding cinders, haydite, pumice, slag, and quarry and mine products, American offers a complete line of grinders in eight sizes to meet all varying plant requirements. Their capacities range from 15 to 80 tons per hour.

If accurate grinding, in volume, poses a problem in your plant . . . ask for a non-obligating consultation with the "American Specialist" to take advantage of the years of experience he can offer you . . . write, wire or phone.

American No. 9 Grinder

This 30-yard capacity grinder has been designed to give big-volume aggregate production with a minimum of grinding costs. Mullers are adjustable to any height, and for finer grinding, the grinding surfaces run together.



American CLAY MACHINERY

A Division of HUBER-WARCO Company
Marion, Ohio, U. S. A.

PLANTS IN MARION AND BUCYRUS, OHIO • CABLE ADDRESS: HUBARCO
CLAY MACHINERY • GRINDERS • ROAD ROLLERS • MOTOR GRADERS • MAINTAINERS

mended that drying time temperature should not exceed 240 deg. F. Warm air should enter at a low temperature and leave at a higher temperature to keep moisture in the air. Drying shrinkage is only one of several properties which affect the degree of cracking in blocks; others are modulus of elasticity, temperature, and tensile strength of the units. Any type of curing which includes moisture will be better than curing at high temperature and atmospheric pressure.

In a subsequent discussion following the symposium, a question was asked regarding the availability of data on freezing-and-thawing resistance of blocks when cured by low- or high-pressure steam. Mr. Valore answered this query by stating that this resistance is increased by high-pressure curing, according to Menzel's data, but that this conclusion does not apply to all cases. This opinion was confirmed by Mr. Copeland, who stated that there are no tests on this quality. The relative fire-resistance of blocks cured by the two types has not been definitely developed, according to Mr. Valore, who added that the soundness of the aggregates go far in determining this characteristic.

Upon the resumption of the meeting on Wednesday morning the important subject of credit was discussed by Walter D. Kelsey, president, Houston Association of Credit Men, in an address entitled *Credit—The Atomic Element in Business.* Mr. Kelsey pictured a new type of credit man who can best succeed in the confusion of the present day—one who is able to say "Yes" instead of "No" as to many requests for credit. He should be a banker, a collector, and a student of human nature. He should be able to explore the marginal accounts, where there is an appreciable profit, along with a measurable loss.

Mr. Kelsey stated that a higher type of business efficiency is required today, that costs must be cut at every opportunity, that all facilities must be used to the maximum, that products must be improved, and that new methods of production and distribution are warranted. He feels that salesmen do not make enough personal calls today—that there are too many "envelope salesmen." He told several stories to illustrate this point. Summing up his forceful presentation, he declared that future success for all of us—individually and for groups—will depend upon the degree of confidence which we have in business, and how well we exhibit this confidence to our customers, coducers, and others with whom we are in daily contact.

Substituting for J. D. Piper, vice-president for promotion, P.C.A., Chicago, Ill., who was unable to be present, S. H. Westby, manager, Housing and Cement Products Bureau, P.C.A., Chicago, Ill., told of the promotional plans of that association. He reviewed the list of promotion aids which P.C.A. has issued over the last 20 years. He stated that two major projects have been worked on over the last three years. Those on special curing and drying processes are now complete. Job-site studies are being made on dry blocks exposed to rain, to learn how much shrinkage may be expected, and what effect carbon dioxide in the atmosphere has on forming new compounds in the surface skin of the exposed units.

Mr. Westby described a series of tests on the problems of low mortar bond strength of units, on units laid in stacked bond in load-bearing walls, and on C_2O production commercially. He feels that the housing market is the largest field for future promotion, as 80 percent of all houses are now built of wood, an enviable field to enter. P.C.A. promotion of concrete masonry will be directed mainly to the builder, as it conceded that people *buy* homes today, rather than *build* them. Mr. Westby said that 850,000 new homes are needed, and that 250,000 homes are removed from the market each year. A farm-to-city migration requires another 150,000 homes, making a grand total of 1,250,000 urban homes needed. A new housing booklet in four colors will be available in six months.

W. P. Markert, director of promotion, N.C.M.A., Chicago, Ill., told of that association's plans for the future. He declared that the public must be *sold* the better product, and that it will *not* "beat a path to the maker's door." New ideas must be constantly sold, as the buyers do not *wait* for the better product to come along. They buy from day to day; so our selling must parallel this type of buying. He cautioned producers to keep a critical eye on their production costs, so that they will not be caught in 1956 by the anticipated increased labor costs, credit curbs, and a possible lower demand for their product.

Considering the tremendous construction market, Mr. Markert feels that there is no way to avoid "shortages" *per se*. These occur in all materials and in most part produce price advances. He pointed out that concrete masonry prices are far behind the 700 percent increase in overall construction costs in the last 20 years. Most of the rise in construction in the last few years, he stated, has been in industrial buildings, plant expansions, and remodeling. The next largest units are stores and mercantile establishments. He felt that the "brief Geneva daydream" would result in a cut in military expenditures, but that additional federal funds would be channeled into school construction in 1956-7.

Mr. Markert stated that our competitors are awake to these facts, and that they are bringing out units which will be competitive. To keep abreast of this trend, N.C.M.A.'s promotion program will be larger and will include the following: publicity kits, packaged speeches, sales and merchandising conferences, calendars, sales portfolios, photo print services, and new home plan books. All these items will be ready in 1956; some are now in the mail.

Final remarks at this meeting were made by Earl W. Peterson, vice-president, Ideal Cement Stone Company, Omaha, Nebr., and president-elect of the N.C.M.A., who thanked the Texas contingent for making his first visit to the state an enjoyable one. Mr. Peterson feels that the future holds only good prospects for those who work hard and try to appreciate how really worthwhile the world is, regardless of the confused state it appears to be in at present. He pledged all his abilities to carrying out the aims and purposes of the association. The golden anniversary of his firm's founding will occur next year, an event fittingly climaxed by his election to the presidency of his association. E. W. Dienhart, executive secretary of N.C.M.A., Chicago, Ill., expressed his appreciation to the meeting, congratulating those who had arranged the full program on subjects so pertinently instructive.

The program committee included the following: E. M. Barnes, Knox Concrete Products, Knoxville, Tenn.; Harold M. Dodds Jr., Texarkana Concrete Products, Texarkana, Tex.; James C. Fountain, Dodds and Fountain Concrete Products, Greggton, Tex.; Ed C. Jancik, Texcrete Company, Houston, Tex.; George W. Katterjohn, Katterjohn Concrete Products, Paducah, Ky.; C. J. Needham, Aquatite Tile Company, Bradenton, Fla.; Henry O. Pommer, John A. Denie's Sons Company, Memphis, Tenn.; and Cedric Willson, Texas Industries, Fort Worth.

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MODEL P-7A 7,000 lbs.
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it turns in the middle— takes the corners like a breeze

Erickson has created a revolutionary new idea in platform trucks—it's ARTICULATED—with a joint or pivot between platform and drive wheels. Models P-7A and P-10A are the units for the new and unusual operations, —autoclaves, for instance—where you need utmost maneuverability with heavy duty capacity. With the ARTICULATED design, platform bed can be made up to 10 or 12 feet and still handle heavy, bulky loads with ease. These articulated models are in addition to the veteran Erickson P-5 and P-7 standard models, and built with the same rugged durability.

Erickson Fork Trucks are made in 10 sizes from 2,000 to 20,000 lb. capacity. Send for circular on the complete Erickson line.

STANDARD PLATFORM TRUCK
MODEL P-5, 5,000 lbs.
MODEL P-7, 7,000 lbs.

MODEL F-4R, 4,000 lbs.
MODEL F-5R, 5,000 lbs.
MODEL F-6R, 6,000 lbs.

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N. C. M. A.

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JANUARY 23-24-25, 1956

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ROLL CRUSHER PRODUCTION TIME DOUBLED...

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Roll wear encountered in crushing extremely hard blue granite rock to critical specifications was limiting production at Arizona Sand and Rock Company's portable plant, near Phoenix. Every hour of running time had to be matched with an hour down for maintenance of the rolls! Days just weren't long enough to produce tonnages required and still keep equipment in shape... at least not by ordinary methods.

To avert an impending aggregate bottle-neck, management turned to the new Stoody semi-automatic hard-facing process, set up as a routine repair technique. Time required for maintenance was immediately cut in half... and the hours gained each day were converted to a much needed second production shift!

Low spots on the pair of 40" x 22" rolls are nightly built up as necessary with Stoody 7/64" diameter Manganese. Corrugations are capped with Stoody 100. Both of these alloy materials are supplied in tubular wires for semi-automatic application. High deposition rates—7 to 15 pounds per hour—are several times faster than manual welding. Considerably less heat input is required than by other methods. Deposits are sound and free from porosity. No flux or flux dams block the weldor's view and stub end losses are eliminated.

By permanently installing the semi-automatic welder as part of the crushing equipment no time was lost preparing for nightly maintenance.

If you have maintenance problems on any of your heavy equipment, we'd suggest that you ask your Stoody dealer (check the "yellow pages") for new literature on STOODY ALLOY TUBULAR WIRES, or write direct.

STOODY COMPANY
11971 East Slauson Avenue
Whittier, California

Ready-Mixed Concrete

Industry Shows Normal Annual Gain

By ROY L. PECK

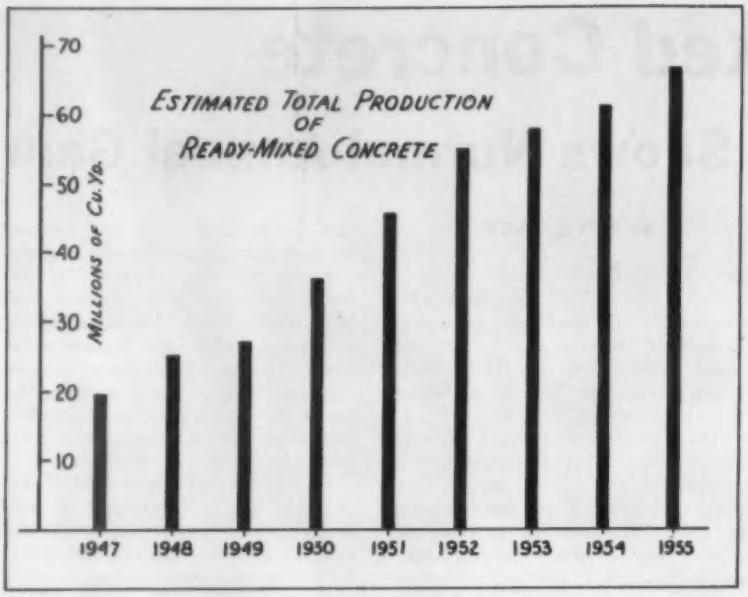
THE return of questionnaires sent to representative producers of ready-mixed concrete in the last days of 1955 revealed some interesting trends in the industry. Neither a complete survey or accurate cross-section is possible today, and therefore any statements as to the total output of concrete over the last three years must be at best well-informed estimates. In reporting the information made available to us we shall endeavor to reach conclusions which shall be the bases of accurate and interesting comparisons. Trends which are apparent will be pointed out.

Production Volume From the information contained in the returns, we are of the opinion that the ready-mixed concrete industry produced approximately 66,500,000 cu. yd. of concrete in 1955. The producers who answered our questions estimated that their business was 8.2 percent better in 1955 than in 1954, which in turn was over 20 percent better than in the preceding year, 1953.

These producers reported an average of 1.46 plants per company, with production of 27,200 cu. yd. per plant or 39,500 cu. yd. per company in 1955. The average increase in production for the reporting companies throughout the country varied considerably. For purposes of more accurately describing the operations of companies in various sections of the country, we divided it into five sections, North Central, Northeast, Southeast, Southwest, and West. In this the North Central and Eastern sections remain as described in the concrete products review. In the Southern section the division has been made at the Mississippi River, into Southeastern and Southwestern areas. The greatest increase in production seems to have occurred in the Southwest, where producers reported an average increase of 27.6 percent over that of 1954.

In the North Central section this increase was 5.5 percent; in the Northeast, 4.6 percent; in the Southeast 7.0 percent; and in the West, 13.3 percent. An unusually large volume of construction in the Western section probably accounted for the greater increase in business there, while the lower volumes in the eastern sections might be explained by the fact that a peak in the

Aerial view of the new ready-mixed concrete plant of the Cleveland Builders Supply Company, Cleveland, Ohio, which has a capacity of 200 cu. yd. per hour, making this one of the largest single-unit plants in the country.



construction of super highways in those sections had been reached and for the greater part of the year was declining. Another fact is that the construction of appurtenant structures such as underpasses, bridge abutments, etc., which would be served by the ready-mixed concrete industry, had already taken place for the most part in 1954.

An average consumption of 1.32 bbl. of Portland cement per cu. yd. of ready-mixed concrete was reported. This figure varied slightly, from 1.21 bbl. in the Southwest, to 1.41 bbl. in the Southeast. Based on this factor, the ready-mixed concrete industry used about 87,000,000 bbl. of portland cement, or about 29.4 percent of the total shipments of portland cement in 1955, as compared to 82,000,000 bbl. in 1954. This percentage was just slightly less than that reported the previous year; and the fact is probably acounted for by the increased output of cement in 1955. In this sense it does not represent any interruption in the series of gains the ready-mixed concrete industry has made in the last two or three decades in the proportion of the cement used in producing a greater amount of ready-mixed concrete each year. It is not even certain that there has been a drop in the percentage used by the ready-mixed industry, as this may be due to the vagaries of sampling.

Future Outlook The predictions of producers as to their business prospects in 1956 varied widely in the degree of change. Fifty percent of those replying felt that business would be an average of 15 percent better in 1956; 11 percent said that it would be worse; 28 percent thought it would be about the same as in 1955, and 11 percent couldn't decide. The expected availability of more portland cement in 1956 was an influence in many of these statements, coupled with the feeling that the construction volume would hold up in most areas. Most optimism was apparent in the Eastern plants, where about 90 percent of the producers reporting said 1956 would be better.

Applying this optimism practically, two-thirds of the producers answering stated that they contemplated spending an average per plant of $33,000 for new equipment or modernization. This was especially noted in the Western plants, where 85 percent of the reportees felt that an average expenditure of nearly $50,000 per company would be necessary to increase their capacity to the point where they could take care of 1956 business. In this connection, most operators felt that the contemplated expansion of the nation's highway systems for the next ten years would help the industry, but that cement would be in short supply for the first third of that period.

Type of Operation Returns indicated that about 85 percent of all plants are using transit mixing in their operations. Others, to the extent of 12 percent of the total, have installed central mixers in their plants, while the remaining 3 percent have both types of operation. If there is a trend toward central mixing in the newer plants being built, it was not apparent from the returns, as the different sections of the country did not vary much from the data given on the subject last year. Geographically, the North Central section showed that 78 percent are using transit-mixing; in the Northeast, 91 percent; in the Southeast, 89 percent; in the Southwest, 98 percent; and in the West, 90 percent.

The number of plants per company reporting, averaging 1.46, varied considerably in different areas. North Central producers averaged 1.28 plants; Northeast companies, 1.94 plants; Southeast, 1.24; Southwest, 1.38; and western operations showed 1.73 plants per company. The general average and the sectional variations, somewhat less in figure than last year (1.57), might indicate that the trend of more plants per company had reached an economic level in 1954 or 1955. It is becoming apparent that a ready-mixed concrete business is largely a delivery or hauling operation, and that economies can be better effected—especially in large urban centers—by decentralization of facilities. As an example of this, one very large producer in a Midwestern city has an average haul of less than 3 miles per round trip, taking concrete from a dozen strategically located plants.

Hauling Equipment The number of truck mixers per company increased about 16 percent during 1955, compared with an increase of only 10 percent in the previous year. This figure varied in different regions, the greatest increase being reported in the West and Southwest areas, 26 and 27 percent respectively. The two Eastern areas reported increases of 22 percent, while the North Central plants operated only 7 percent more units per company than in 1954.

The number of truck units per plant for all companies reporting was shown to be 6.6 units per plant for 1955. By divisions, the average breakdown showed 7.3 units per plant in the North Central area, 5.1 in the Northeast, 6.6 for the Southeast, 6.1 for the Southwest, and 7.5 units per plant for the West.

The average truck capacity in cu. yd. of rated capacity per unit for the whole country showed an increase from 4.08 cu. yd. in 1954 to 4.31 cu. yd. in 1955, or an increase of 5.5 percent. The greatest increase was reported in the West, where truck mixer capacity went up 10 percent

from 4.84 to 5.32 cu. yd. per unit.

Other sectional increases of rated capacity within the year were as follows: North Central—6.2 percent, from 3.86 to 4.10 cu. yd. per unit; Northeast—1.2 percent, from 4.24 to 4.29; and Southwest, increasing from 4.03 to 4.17 cu. yd. per unit. The smallest increase in truck capacity occurred in the Southeast—only 1.0 percent, from 4.05 to 4.08 cu. yd. per unit.

We feel that until weight limitations are raised in certain states, the producers in those states have about reached a limit on maximum loads which may be carried. Another factor which affects the determination of the average truck unit capacity is that almost every company will continue to operate some smaller-than-maximum units, such as those having 3-, 3½-, or 4½-cu. yd. drums. The high capacity level in the Western states shows that efforts to raise the loads carried have borne some fruit during the last year, as 1954 figures showed the average in that area to be 4.83 cu. yd. per unit.

Hauling Capacity Total truck mixer capacity per plant, from all areas, averaged 28.4 cu. yd. in 1955. The same producers said that this figure was 41.6 cu. yd. per company reporting. This figure compares with 46.8 cu. yd. per company for 1954, representing an 11 percent decrease for those companies which reported for both years. Sectional variations were again considerable. Combining the figures for the number of plants per company in each section, as reported, with the plant capacity in rated volumes of drums, we find that the North Central companies have 38.3 cu. yd. in truck drum capacity, the Northeast 40.2, the Southeast 33.4, the Southwest 35.1, and the West 69.0 cu. yd. per company. It appears that there is no reasonable explanation for the decrease in this average truck capacity per company under the figures reported by the companies for their 1954 operations, except as a possible vagary of sampling in the questionnaire form. It does not coincide with the figures furnished by the same reportees as to other essential data.

The inaccuracies which creep into any method of sampling an industry may be a factor in the above discrepancy. It may be presumed that a number of smaller plants, with fewer mixers operated per company, have been established within the year 1955 in certain areas. Another possible reason for the discrepancy may be that inaccurate data were submitted.

Selling Prices Average selling prices per cu. yd. of concrete delivered to the job site, as reported by the companies answering, rose 2.0 percent, from $12.86 in 1954 to $13.13 per cu. yd. in 1955. Prices charged in different sections reflected various sectional costs. The highest prices were obtained in the Northeast, where the price rose from $13.25 in 1954 to $13.57 in 1955 (2.4 percent). The North Central difference was from $12.71 to $13.00 (2.3 percent), the Southwestern from $12.60 to $12.99 (3.1 percent), and the Western from $12.27 in 1954 to $12.76 (4.0 percent) in 1955. Practically no change in selling prices were reported in the Southeast, the figures averaging about $13.44 in both years.

The difference between the average selling price delivered to the job site—$13.13 for the entire country—and the figure of "average value per cu. yd."—$12.28—as shown by the excellent industry survey conducted by the National Ready Mixed Concrete Association is probably explained by the delivery costs which average 85 cents per cu. yd. The results of the N.R.M.C.A. survey were published in the CONCRETE MANUFACTURER in July, 1955. While all prices in all sections showed a continued steady rise from year to year, it is felt that the rise in price of ready-mixed concrete is far behind the increases shown in all other construction materials.

The N.C.M.A. survey, while it covers a very large proportion of the industry and is certainly representative in the large returns which are received therefrom, intentionally omitted certain figures applying to the whole industry. The survey includes only essential data from year to year on basic production, consumption of materials, value of the output, and types of plants and equipment. Many data are included in our survey beyond this point, which we have felt would provide interesting comparisons. It is hoped that the opinions of representative producers will be forthcoming as to the relative value of the data we have presented. We invite suggestions as to any additional data which might be included in the future.

Hourly Wages The average hourly wages paid in the industry, as reported, rose from an average rate of $1.60 per hour in 1954, to $1.70 per hour paid in 1955. This represented an average increase of 6.2 percent. Sectional average wages paid were as follows: North Central, from $1.66 in 1954 to $1.75 in 1955 (5.4 percent); Northeast, from $1.73 to $1.92 (16.7 percent); Southeast, unchanged, $1.13 for each year; Southwest, from $1.34 to $1.44 (7.5 percent); and West, from $2.06 in 1954 to $2.26 in 1955, an increase of 10.0 percent. As previously reported, it is seen that wages in the industry were highest in the Western and lowest in the Southern sections of the country, with the greatest increase coming in the Northeast.

Statistics on the number of employees per company reporting provide an interesting comparison as to the size of the plant or the degree of mechanization which has been achieved. The average for the whole country from those companies reporting was 17.7 persons per company. The sectional averages varied from 14.6 in the Southeast to 21.5 persons in the West, indicating that the larger companies are found in the latter area.

Miscellaneous The use of bulk cement by ready-mixed concrete plants was shown by the returns on this detail. The average for all plants reporting was that 83.5 percent used bulk cement. This figure varied from the average of 80.5 percent in the North Central section to 92.5 percent in the West.

The use of admixtures or air-entraining cement or agents among ready-mixed concrete plants increased slightly from 39 percent in 1954 to 42 percent in 1955. The lowest use of these occurred in the Southwest (14 percent) and the highest in the North Central section (52 percent). The average annual cost of maintenance and supplies per company was $46,400.

In supplementing a short supply of cement they experienced in 1955, many ready-mixed concrete producers redesigned their standard mixes to include fly ash, thus extending their normal cement supply at a slightly lower material cost. Depending upon the percentage of fly ash used, these companies found that such inclusions produced a more workable mix with lower water-cement ratios, resulting in concrete which was easier to place, yet had the required strength. One Midwest producer of fly ash reported to us that his sales to ready-mixed concrete firms was five times greater in 1955 than in 1954.

The percentage of plants using lightweight concrete aggregates, mostly for floor and roof fill, was still

(*Continued on page* 315)

revolutionary new concept . . .

. . . a COMPLETE UNIT

before you consider any new mixer, think what these features will mean to your business

1 single frame construction

No more costly "fighting" between mixer frame and truck frame.

2 power from FRONT of truck engine

The Smith "INTEGRAL" uses the truck engine. Power is taken off *ahead* of the truck clutch. Regardless of truck clutching or gear shifting, *the mixer continues to run.* This is a big advantage for stop-and-go driving, paving and curb and gutter jobs.

3 standard trucks with manufacturer's warranty

Take your choice of most standard trucks. The front power take-off and integral frame design are approved and warranted by the truck companies.

4 1100 pounds less weight

With no engine and no mixer frame, the Smith "INTEGRAL" cuts overall weight by 1100 pounds per unit. *Yet not one ounce of structural strength is sacrificed.*

5 better weight distribution

The Smith "INTEGRAL" is 7" shorter than comparable size Smith mixers with separate engine drive. Because the mixer is lighter and the center of gravity closer to the front, bigger legal payloads can be carried or shorter trucks can be used.

6 much less maintenance cost

You have only one engine to service — not two. Six cylinders instead of 12 to take care of. Experience has proven that there is little or no increase in maintenance on the truck engine and that costly maintenance of the mixer engine is completely eliminated.

7 much less fuel consumption

Careful records kept by operators for a year of job tests prove that *the Smith "INTEGRAL" can save more than $40 per month on gas and oil alone,* compared to fuel costs on separate engine drives.

8 much more stability

There is no mounting strip on the Smith "INTEGRAL". The mixer is tied directly to and set lower in the truck frame. Valuable inches of headroom are saved and there is much less chance of tip-over.

The T. L. Smith Company presents the revolutionary new "INTEGRAL" with a great deal of pride. First to conceive and build a truck mixer unit which *uses the truck frame as the mixer frame and takes the power from the front of the truck engine crankshaft,* Smith engineers consider the "INTEGRAL" their finest contribution to the industry in more than 55 years of "firsts."

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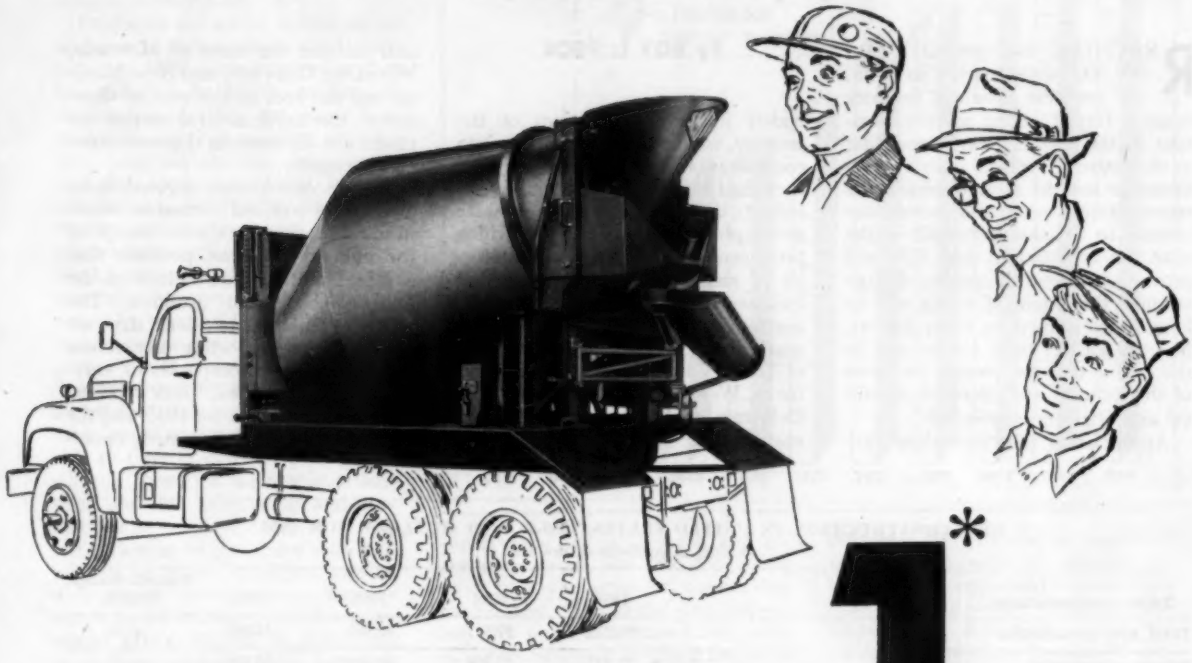
ONE FRAME FOR BOTH TRUCK

the "INTEGRAL" is all new . . . yet thoroughly job-tested

This great new Smith "INTEGRAL" mixer offers you a combination designed by Smith exclusively for the ready-mix industry. The "INTEGRAL" becomes a component part of your truck, making *one* solid, dependable, long-lasting unit.

But new as it is, the Smith "INTEGRAL" was not

designed for the ready-mix industry



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AND MIXER — ONE ENGINE FOR BOTH

readied for you until it was tested, refined, and perfected. 88 units have been produced to test the front engine principles and design. 101 integrally mounted Smiths are working in the field today. All of these mixers have been job-tested in various sections of the country for as much as two years, to prove conclusively that this is the finest truck mixer ever developed for the ready-mix industry.

Here, for the first time, is a composite of a mixer and standard truck which is designed specifically for the ready-mix industry.

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Block Industry Passes Two-Billion Mark

Producers Expect 1956 to Be a Better Year

By ROY L. PECK

REACHING the epochal 2,000,000,000 block market in 1955, the concrete products industry steadily forged ahead to new horizons in the coming year. According to the returns received from a questionnaire sent to a large number of representative producers across the country in the closing months of the year, the consensus is that 1956 will prove to be a year of continued large volume, the extent of which will be largely determined by many factors. Not the least of these factors will be the degree that the present problems of the industry are solved by technical and engineering research.

Appreciating that conditions vary widely in different sections of the country, we have taken this fact into consideration in evaluating the data furnished by block producers, by dividing the country into separate geographical areas in each of which producers operate with some uniformity of methods. The eastern section includes Pennsylvania and all states north and east of that state; the southern section includes the states of Texas, Oklahoma, Arkansas, Kentucky, West Virginia, Maryland, and Delaware and the area south and east of those state; the western section includes the states of Montana, Wyoming, Colorado, and New Mexico and the area to the west of those states; the north central section includes the 12 states in the remainder of the country.

In the conclusions derived from the reports received it must be borne in mind that our method of sampling the industry does not presume that a representative cross-section of the industry has been attained. The value of such conclusions that we draw lies in reporting experience data from many companies of varying size in any area. Data received include information for 1955 and the two preceding years on such opera-

NEW CONSTRUCTION IN UNITED STATES, 1953-55 AND OUTLOOK FOR 1956[1]
(Value, in millions of dollars)

Type of construction	1953	1954	1955	1956	Percent change, 1955-56
Total new construction	**35,271**	**37,577**	**42,000**	**44,000**	**+ 5**
Private construction	23,877	25,768	30,000	30,850	+ 3
Residential building (nonfarm)	11,930	13,496	16,345	16,200	− 1
New dwelling units	10,555	12,070	14,765	14,300	− 3
Additions and alterations	1,108	1,130	1,250	1,500	+20
Nonhousekeeping	267	296	330	400	+21
Nonresidential buil ding (nonfarm)	5,680	6,250	7,630	8,700	+14
Industrial	2,229	2,030	2,400	2,800	+17
Commercial	1,791	2,212	3,045	3,475	+14
Warehouses, office and loft buildings	739	958	1,125	1,225	+ 9
Stores, restaurants and garages	1,052	1,254	1,920	2,250	+17
Other nonresidential building	1,660	2,008	2,185	2,425	+11
Religious	472	593	740	850	+15
Educational	426	529	500	525	+ 5
Social and recreational	163	228	245	275	+12
Hospital and institutional	317	337	350	350	0
Miscellaneous	282	321	350	425	+21
Farm construction	1,731	1,560	1,400	1,350	− 4
Public utilities	4,416	4,341	4,465	4,450	(2)
Railroads	442	353	340	400	+18
Telephone and telegraph	615	655	700	775	+11
Other public utilities	3,359	3,333	3,425	3,275	− 4
Local transit	30	25	25	25	0
Pipelines	271	300	325	350	+ 8
Electric light and power	1,829	1,900	1,800	1,700	− 6
Gas	1,229	1,108	1,275	1,200	− 6
All other private	120	121	160	150	− 6
Public construction	11,394	11,809	12,000	13,150	+10
Residential building	556	336	250	275	+10
Nonresidential building	4,346	4,641	4,220	4,225	(2)
Industrial	1,771	1,506	705	475	−33
Educational	1,714	2,134	2,450	2,700	+10
Hospital and institutional	365	365	330	275	−17
Other nonresidential building	496	636	735	775	+ 5
Military facilities	1,307	1,030	1,320	1,500	+14
Highways	3,160	3,750	4,100	4,600	+12
Sewer and water	883	982	1,080	1,200	+11
Miscellaneous public-service enterprises	200	218	280	500	+79
Conservation and development	830	704	600	675	+13
All other public	112	148	150	175	+17

[1]Joint estimates of the U. S. Department of Labor and the U. S. Department of Commerce.
[2]Change of less than one-half of 1 percent.

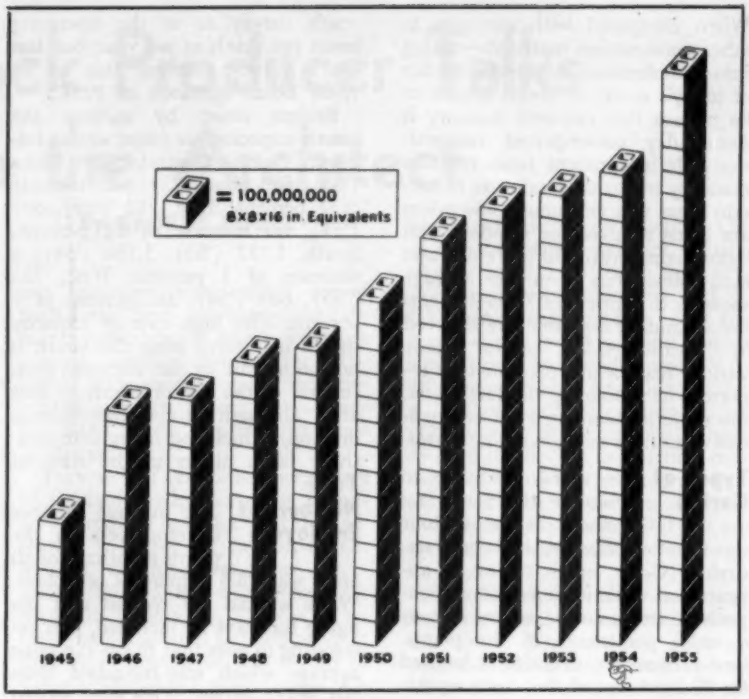
tions as estimates of total production, percentage of lightweight units made and materials used, selling prices, types of curing, number of block machines, hourly capacity, number of employees, amount and types of equipment, hourly wages paid, and cement consumption.

Producers are asked to look ahead and give us their opinion as to: their expected 1956 output; whether they feel this will be larger, smaller, or the same as in 1955; the major factors governing their opinion; whether they plan an increase in capacity and the approximate cost of this; whether they lost production in 1955 due to any shortages, etc., and the approximate amount of this loss in blocks not produced; what restrictions affected their market and how seriously; what additional items they make besides concrete blocks; what proportion of their total sales volume is represented by such items; what allied materials or equipment are sold, leased or otherwise made available to their customers; estimates of what is spent for maintenance supplies and for advertising and promotion.

Evaluation of the above data permits us to draw intelligent conclusions as to average operations or trends in the industry, which we feel would prove helpful or interesting to other producers. The survey is strictly confidential and it is not required that the reportee identify himself. The postmark on the mailed reply generally locates the area in which the plant is situated. There is no certainty that the same plants reported this year as did on our survey made a year ago. It is unlikely that such would be the case; but if so, any similarity is coincidental.

Production Volume Manufacturers of concrete products answering our questionnaire reported that total production of 8-in. equivalent blocks averaged 19 percent over the production in the same plants in 1954, which in turn was 31 percent over that of 1953. Adding this increase to our estimate of a year ago, 1954 output reached 1,900,000,000 units, would indicate that approximately 2,600,000,000 equivalent units were made in 1955. The average sectional percentage increases were: North Central 18 percent, Eastern 16 percent, Southern 24 percent, and Western 19 percent.

The average size of the plants on which the above data was furnished was 1,300,000 units made in 1955, 1,140,000 in 1954, and 906,000 units in 1953. We feel that returns were received from plants somewhat above the average size in all areas, and accordingly point out this conclusion as a possible factor in considering the relative value of the data following. As previously stated, we wish to report information which has been received from those plants which co-operated in this survey, and not offer the estimates as representing a cross-section of the industry.



Lightweight Units Approximately 51 percent of the total block made by the plants reporting were of lightweight aggregates. This is slightly above the figure of 1954. The total returns show that cinders were used in 29 percent of the lightweight output, expanded slag 37 percent, expanded clay or shale in 22 percent, pumice in 4 percent, and other lightweight aggregates in 8 percent of the cases. Areawise, the Western plants used the most lightweight aggregates, 84 percent of the total in that area being lightweight blocks, representing an increase of 17 percent over 1954 use. This is understandable in view of the availability of such aggregates in the West.

In the East 36 percent of the total was lightweight units, an increase of 17 percent above 1954 proportions. The Southern plants used lightweight in 36 percent of their total block, or an increase of 24 percent over 1954. In the North Central plants 36 percent of units were reported as being lightweight, an increase of 17 percent in a year. By class of materials, cinders used were 33 percent less than in 1954, expanded slag use more than doubling with a 123 percent increase, expanded shale or clay increasing 18 percent, pumice 43 percent more, and other lightweight aggregates showed a slight increase in the year.

Selling Prices The average price of an 8-in. unit, as reported by all producers in 1955, was 19.5 cents per unit f.o.b. plant. This compared with a price of 18.9 cents received for the same unit in 1954, which represents an increase of 3.1 percent. The highest area price received for blocks was in the West, where plants reported getting 21.5 cents in 1955 as against 21.0 cents in 1954, or 2.4 percent more. Other area average prices were: East, 18.4 cents ('55) against 18.0 cents ('54) or an increase of 2.2 percent; North Central, 18.9 cents ('55) compared with 18.7 ('54) or 1.0 percent more; South, 20.8 cents ('55) against 1.93 cents ('54) or 7.7 percent more.

The significant note in the above study is that while a 3.1 percent higher price was received in 1955 for units, this was considerably less than the increases occurring in the costs of the basic materials in the units. During the year the price of cement increased about 5 percent, that of sand and gravel 6 percent, and of most lightweight aggregates 6 to 7 percent.

When compared with increases in other construction materials—taking into consideration the higher quality of today's units—it would appear to be certain that concrete masonry is decidedly under-priced competitively. It is apparent from remarks made by reporting producers in certain areas that ridicuously low prices are being received for standard and lightweight units, and there are also many deviations from the average showing that prices of 28 to 30 cents for a standard 8-in. unit are received in "hard-to-get-to" places. Many various reasons are presented by reportees in explaining the low prices, the majority blaming local competitive conditions as a governing factor.

Types of Curing We asked producers to designate their curing methods as one of four classes—low-pressure, high-pressure, drying (C_2O), or air curing. It appears that while it is increasing, high-pressure steam curing is used in only a small percentage of the plants. Low-pressure steam curing accounted for 83.5 percent of the plants reporting this item, only 3.5 percent stating that high-pressure was used. Of the remaining plants (13 percent) the choice was equal as to drying (C_2O) or air-drying curing.

In the North Central states, 84 percent of the plants used low-pressure steam curing; in the Eastern plants 90 percent; in the Southern 77 percent; and in the Western plants nearly 100 percent cured in the conventional manner. Several producers stated that they were considering changing over to autoclave curing, others stating that they were awaiting definite research results before determining to change their present method of curing.

Hourly Capacities Answers on this item were quite complete and included data on both '55 and '54 operations. Returns showed an average of 1.39 machines per plant, this comparing with a figure of 1.33 machines the year previous in the same plants. This decrease in machines per plant of 4.3 percent might indicate the use of less machines, but probably reflects the fact that fewer, but larger machines are being used in 1955. Hourly capacities, in 8-in. equivalent units per plant, was shown as 808 units compared with 777 units in 1954, a 4 percent increase. The capacity in blocks per hour per machine, was stated to be 578 units, compared with 522 units in 1954, a gain of 11 percent. Unfortunately, we did not include a question in this year's survey as to the operating hours per machine per year, our last year's survey showing this to be 1,605 hours operated in 1954.

Broken down by sections the hourly capacity per plant was as follows: North Central, 681 hours ('55), 638 hours ('54), an increase of 7 percent; East, 783 ('55), 697 ('54), an increase of 12 percent; South, 1,137 ('55), 1,150 ('54), a decrease of 1 percent; West, 735 ('55), 685 ('54), an increase of 7 percent. The high rate of capacity shown in returns from the South is not borne out by the common conception of the size of plants in that area, although in the geographical division, it included many comparatively large plants in the state of Texas.

Numbers of Employees The average number of employees in the plants reporting for all areas was 18.6 employees per plant. While we did not request that the figure for 1954 be included, it is interesting to note that this is the same average which was furnished from last year's survey. This item varied considerably in different areas, the North Central section plants reporting 15.4 employees, the Eastern plants 20.7, the Southern plants 24.8 and the Western plants 15.2 employees per plant. This more or less agrees with the reported size of plants in output annually ('55) which was 1,107,000 units for the North Central plants, 1,740,000 for the Eastern plants, 1,626,000 for the Southern plants and 1,777,000 units produced in the year in Western plants reporting.

A comparison shows the relative efficiency of the plant, insofar as the annual output per employee is considered. In the North Central plants this figure is 71,900 units per year, in the Eastern plants 84,200 units, in the South 65,600 units and in the Western plants each employee produced 116,800 units, or nearly double that of the production per employee in the South.

Hourly Wages The average hourly wage paid in the industry by the plants reporting was $1.41 per hour for 1955, as compared with the $1.30 per hour paid by the same plants in 1954. This represented an average increase in wages of 8.5 percent. Similar increases occurred in all areas, but in varying degree, as follows: In the North Central area wages in 1955 averaged $1.53 compared to $1.39 paid in 1954 (10.8 percent); in the East this comparison was $1.43 to $1.37 (4.4 percent); in the South, $1.06 to $.99 (6.1 percent); in the West $1.66 to $1.52 (9.2 percent).

This information, combined with the average number of employees per plant and the hourly capacity per plant gives us a figure as to the 1955 labor cost per unit of 3.24 cents per 8-in. block for the overall average. Computed separately for each sectional average, this figure is 3.46 cents for the North Central plants, 3.77 cents for the East, 2.30 for the South, and 3.44 cents for the Western plants. As there was no request for hourly capacities in these plants in 1954, this comparison cannot be made.

Types of Equipment From information received from the producers making returns, it can be estimated that the hypothetical average plant has 4.05 trucks operating, uses 2.39 fork lift trucks around the plant, has three front-end loaders and one ¾-cu. yd. capacity yard crane for every four plants.

Some deviation from this general average occurs in computing the average equipment used in the plants in the different areas. In the North Central section the list would include 2.64 trucks, 2.57 fork lifts, three loaders in every four plants, and one crane in every six plants. In the East the plant equipment would be 5.18 trucks, 2.27 fork lifts, three loaders in every four plants, and 2.73 cranes. Southern plants would be likely to use 5.27 trucks, 2.0 fork lifts, and two loaders and one crane in every five plants. In the Western plants these figures would be 5.8 trucks, 2.8 fork lifts, 1.4 front end loaders and practically no cranes.

Cement Consumption Data in the returns regarding the annual cement consumption turned out to be quite erratic, to the extent that it was virtually impossible to arrive at an average figure as to the number of blocks produced per sack of cement used in the plants. This was partially due to the fact that no differentiation was made as to the cement used per standard (heavy) block and per lightweight unit. Returns were erratic as to the amount of cement used in the year by a majority of those making returns, some figures furnished being entirely without accurate basis. It is hoped that in a future questionnaire questions can be so phrased as to bring in accurate data.

If we can assume that the cement content remained constant from 1954 to 1955 (an unlikely assumption at

(*Continued on page* 311)

A Block Producer Talks To the Architect

By GEORGE KOGEL*

A BASIC but limited building material for many years, concrete masonry units have, today, largely displaced such material as terracotta, gypsum, limestone, marble, and clay brick, as a basic unit. Developing from a backyard stage, where Italian masons, masters in the use of concrete, taking advantage of off-seasons in the construction industry, fashioned concrete block in crude wooden forms, the business today has blossomed into a $400,000,000 industry (in annual output) with approximately 2,200 plants spread across the nation, producing approximately 2,000,000,000 units annually.

The relatively recent spectacular growth in the sale and use of concrete masonry building blocks is attributable, in large part, to the increased production and availability of these units. Whereas formerly an operator employing crude hand methods and perhaps some semi-automatic machines could at best turn out several hundred blocks per day, a modest one-machine plant today produces on the average of 6,000 units in one shift.

Equally important in the rapid rise of this building material has been the discovery that lightweight materials such as cinders, expanded slag, clay, shale, pumice, or other derivatives (Celocrete, Waylite, Haydite) can be mixed with cement in forming a block, in place of the heavier weight sand and gravel. The impetus given to the use of block made of these lighter aggregates was tremendous since the prejudice of the average bricklayer in handling a concrete block weighing 45 or 50 lb. was largely overcome by the availability of units weighing 15 to 20 lb. less.

Improvements in the handling of raw materials and more scientific methods of steam-curing have enabled plants to turn out a better finished product at a more rapid rate. Technological advances and improvements in the manufacture of our products have come rapidly in recent years. The list is long—high production block machines, height and density control, automatic batching, improved steam curing, use of high-early and air-entraining cements, additives to mixes, moisture control, feeding devices, etc. Together with modern conveyors, elevators, and lift trucks, the industry has been given the flow of mass production.

For one-half cent or less per pound of finished product, a modern concrete products manufacturer does research, prepares his raw materials, batches, molds, steam cures, stockpiles, delivers and even merchandises his basic commodity. I know of no other manufactured finished product that even approaches this record of value rendered per pound price of a concrete masonry unit. This also explains the phenomenal growth of our industry and the increase in the popularity of our products.

Further, few manufacturers are called upon to produce the miracles we do in terms of service. A truckload of block (enough for one house) delivered to the jobsite within an hour or sometimes less after the order is received! A specially designed concrete unit manufactured and delivered to the jobsite in a matter of days after the blueprint is received at the plant! This is the type of service that we as an industry can be proud of; and again, it has played no small part in the rapid rise in the national usage of block, as compared with competing products.

A block plant today is a fairly complex organization. A plant with two high-production block machines must move in the material and process about 200 tons per shift and when deliveries approximate production, must move out or deliver the same tonnage.

This is a significant materials-handling job, and a well run plant does this efficiently and economically. Fortunately most of our industry has been willing and even eager to embrace the flood of machinery and equipment innovations introduced since World War II. As a consequence, on the average, cost and prices have been kept down in spite of rapidly rising costs in raw materials and labor markets.

The heart of a block plant is a high-production block machine. One of these modern machines, capable of producing 1,000 8-in. equivalent units in an hour, costs close to $50,000. Since this machine consumes material at a rapid rate and further, since it must run uninterruptedly for efficient operation, it is apparent that a host of auxiliary equipment machinery must be maintained in order to keep the flow of production moving. Thus, today a modest yet fully equipped plant runs into a capital investment of perhaps $300,000 and produces several million units annually.

Our high-temperature steam curing procedure in the plant follows this cycle: The molded units are placed in the curing rooms and are allowed an initial set of about two hours. Steam is then turned on and the blocks are steamed until a temperature of approximately 180 deg. F. is reached. The steam is then turned off—this steaming period taking between 4 and 6 hours—and the blocks are then allowed to soak for an additional 3 or 4 hours. Next, mechanical exhausts are turned on to pull out all remaining steam and an appreciable amount of moisture from the kilns prior to the kilns being unloaded.

The characteristics of a good block may be summarized as follows: (1) freedom from staining and popping, (2) trueness of dimension, (3) resistance to breakage and chipping, (4) appropriate texture, and (5) resistance to cracking.

All too often architects and specification writers fix their attention upon one specific factor in this list (to the exclusion of others) and write a specification which is too narrow in its concept. Although it is the wrong approach, this attitude is understandable since different problems arise in various areas in varying degrees of importance. For example, I have run across some specifications for cinder blocks which refer exclusively to cinders and usually end up by specifying anthracite cinders. This is bad for two reasons. First, most of the anthracite cinders (in this area) are of the house-ash variety, with very little structural strength and much foreign matter. Second, if the specification writer in these instances was con-

*From a talk by George Kogel, president, The Cincrete Corporation, Long Island City, N.Y., at the Construction Specifications Institute, New York City, N.Y., September 14, 1955.

Advertisement

Pictured at the founding meeting of the Unit Step Association, membership including some 82 members and wives from the United States and Canada.

UNIT STEP Manufacturer's Association National Convention

February 5 and 6, 1955, The Unit Step Association held its second annual convention in Des Moines, Iowa, with 94 people attending. Present officers were elected to serve another year. Glenn F. Lister, president; Ted Bates, vice president; W. J. Morf, secretary-treasurer; Ed Christian and Walter Smith, Directors.

Mr. D. Blue of the Portland Cement Association presented a talk on *The General Treatment of Precast Concrete.* Eugene Kogl gave some advice on *Curing Concrete, Especially in the Unit Step.* Mr. William Fink discussed *License Laws in Relation to the Unit Step.*

All sessions were warmed with the enthusiasm and spirit reflected from the 1954 meeting, the association's first, which was the 15th birthday of the Unit Step Form Company. Mr. Morf reviewed progress made by the association during the year and showed pictures taken at the first meeting, the first week of July, 1954, when the association was founded in South St. Paul, Minnesota.

It was decided that the next association convention will be held for three days instead of the usual two . . . February 2, 3 and 4, 1956 in Cedar Rapids, Iowa, where Morf Concrete Products is located. Association Headquarters is at the Unit Step Form Co., So. Robert Road, R. 10, South St. Paul, Minnesota.

Officers elected to serve another year pictured with their wives, Mr. and Mrs. Glenn F. Lister, president; Mr. and Mrs. W. J. Morf, secretary-treasurer.

Founder and president of the Unit Step Form Company, Mr. Frank Kogl, conducted first meetings where members chose officers and a board of directors who drew up the constitution and by-laws. Plans were initiated for a 1955 convention in Des Moines.

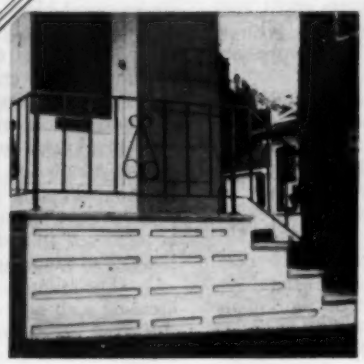
UNIT STEP

America's Famous Firsts

KOGL'S UNIT STEP

first one-piece step

6' 3 riser with platform 42" deep



convenient solution to side entry problem

good looking and permanent on new home

simple and handsome on remodeled home

FIRST ***one-piece hollow-cast concrete step***

FIRST ***non-skid concrete step***

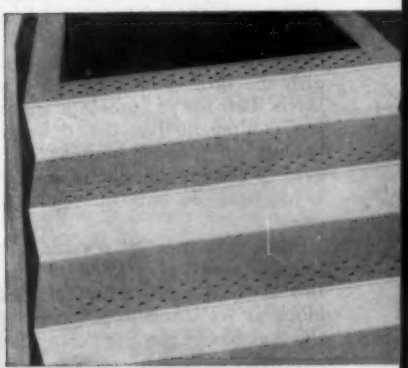
FIRST ***precision-perfect step***

Unit Step forms are made in standard widths of 4, 5 and 6 feet . . . one to six risers high, in one piece, with or without platforms, Steps and railings can be provided in unlimited variations to suit almost every need.

UNIT STEP

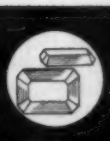
Kogl's Unit Step Forms and methods of casting are covered by seven patents (64) claims. This emblem insures that Unit Steps meet the rigid specifications required by the owner of these patents. Unit Steps are manufactured in the United States and Canada. Forms are manufactured by the Unit Step Form Co., So. Robert Road, R. 10, South St. Paul, Minnesota.

novel arrangement of steps leading over terrace



Interior stairways cast to the architect's specifications under Mr. Kogl's patented methods. 110 flights of stairways were installed in this $3½ million project in Madison, Wisconsin.

RAIL ANCHORING



NON-SKID TREADS

REINFORCED

BACK-LIGHTED NUMBERS and NAMES

cerned with staining or popping, he should have so stated and should have set up his standard accordingly. For him to flounder into a highly specialized field is fraught with danger.

The architect should not tell the manufacturer how to make his product. He should tell him the qualities that are desired in the finished product. Not "process" specifications, but "product" specifications are wanted. This is the manufacturers' constant cry when they run into "peculiar" specifications on block. The architect may tailor the specification to suit the particular case. That is, more stringent requirements are in order for better structures and less rigid qualities for other structures. The block going into a garage type building do not necessarily have to have the same specifications as the block, for example, going into the exposed areas in a bank building.

Our second qualification for "good" block we termed trueness of dimension. This means clean, sharp arises all around and consistent block heights. Surprisingly little is said in specifications concerning this factor. The reason probably is that it is the mason on the job who must wrestle with this problem, and complaints of this nature rarely reach the architect or specification writer. Untrue dimensions stem from worn molds, unclean pallets, machines out of adjustment, etc.—in other words, careless plant housekeeping. I am sure that you know how to take care of this difficulty when you write your specifications.

The third quality, resistance to breakage and chipping, is also easily handled by your specifications. Appropriate compressive strength standards plus proper handling in delivery and on the job sites will insure having less chipped corners and broken blocks and truly cleaner masonry workmanship. Blocks are handled roughly on most jobs, and laborers unfortunately often use the whole block for scaffolding and shoring and give the broken ones to the bricklayers. Our use of automatic unloading equipment has cut down the amount of chipped corners. However, a certain amount of breakage is inevitable in bulk material deliveries.

Appropriateness of texture is our fourth quality of a good block. In this area, the prime use of cinder block is for backup purposes, and thus a block meeting compressive strength standards should suffice, provided it is not so coarse as to lose its density and thus become excessively porous. However, eye appeal is becoming more and more important and exposed uses for block more popular; thus finer and finer textured block are being demanded. One word of caution here. Beyond a certain point, the addition of fines tends to result in a weaker product. The ideal fineness modulus is changed and the optimum gradations of aggregate are destroyed, with a consequent lowering of compressive strength.

Our last quality—resistance to cracking—is the most controversial. There are a host of factors that give rise to cracking in block walls, and there are many practices (most of these are new) which can prevent such occurrences.

What causes cracking? It may arise from any of the following:

1. Bad design and/or workmanship in footings and foundations.
2. Undue stresses in the structure occurring from either external factors such as hurricanes and earthquakes, or internal factors such as vibrations, loads, etc.
3. Abnormal distortions such as expansion of elements in roofs and floors.
4. Movements due to temperature changes.
5. The fifth factor affecting cracking rises from volume changes in the basic material due to moisture changes; in other words, possible shrinkage in the block itself. Here, the block manufacturer has a degree of control, and proper specifications can insure satisfactory performance. Many specifications have stipulated a 40 percent moisture content and have secured satisfactory end results. The Corps of Engineers have required 30 percent moisture content. Investigations in this field are relatively new; and, as is often the case, extreme divergences of opinion exist. At one end are those who hold that high-pressure-steam curing is the only answer. At the other extreme are those block manufacturers who disclaim any fault on the part of the block itself.

None of the first four factors, acting either separately or in combination, is the responsibility of the block manufacturer. The architects, contractors, and engineers must assume full responsibility here.

Our position is intermediate. High-pressure-steam curing does tend to produce a dry unit. However, there are other methods of securing dry block. Additional drying after high-temperature-steam curing, covered storage for adequate periods of time, and protection of units on the job site, are some of these. Further, since strength is the important variable in resisting cracking, it is conceivable that even under high-pressure-steam curing, improper curing methods, or a weak aggregate, or the wrong water-cement ratio in the mix may produce a unit which is more susceptible to cracking than even a non-steam-cured block.

There is enough evidence, however, to indicate that wet or green block will invite cracking from possible shrinkage. In this connection, therefore, moisture content limitations are important, and from these we get adequately dry block.

The following precautions (not prohibitively expensive) should also be explored in order to increase resistance to cracking:

1. The simple expedient of increasing web and shell thickness. In this area solid blocks (75 percent) may be used to great advantage.
2. Expansion and control joints in walls over 25 ft. in length.
3. Mortar joint steel reinforcing.
4. Horizontal reinforcing, such as bond beam block units.
5. Proper mortar mixes.

It is not our purpose here to set up a specification for concrete block. We feel that the applicable A.S.T.M. Specifications are as good as any. However, as with many other products, you undoubtedly find that the difficulty is in the "policing" of the specification, rather than in the preparation of it.

In this regard, our suggestion is to mention two or three reputable manufacturers in the specification. A manufacturer with integrity can do much to obviate policing in checking upon specification performance. Mentioning one manufacturer is setting up a monopolistic specification, which is bad in that it inevitably leads to a higher price for the product than free competition will bring and it also tends to result in a relaxation of standards. This is to be avoided since we are all concerned with keeping construction costs down in the face of an inflationary economy.

At the directors' meeting of the National Concrete Masonry Association, held recently in Colorado Springs, Colo., members discussed the possibility of an N.C.M.A. laboratory and office building in the near future in the Chicago area. A building committee is being set up to study sites, financing, and other factors involved in the project.

Rx Ready Mix

(*From page* 266)

cordance with A.S.T.M. Designation C311.

The chief interest of concrete producers in fly ash, however, stems from the material's pozzolanic activity, as in those days of cement shortages it may be a helpful "cement-stretcher" and at the same time may offer reduction in the cost of materials. These results may come from a judicious replacement of a part of the cement by fly ash. The net saving in the cost of materials in a batch will, of course, depend on the relative costs of cement and fly ash at the plant, as well as upon the quantities used. As fly ash is a refuse material with limited uses, its value at the producing plant is quite low, and it is commonly priced on a ton basis; but the freight rate may be such that the delivered cost may approach or even exceed the current cost of cement.

The pozzolanic activity of different fly ashes—*i.e.*, the development of compressive strength additional to that from the cement content—differs greatly; but all have the same characteristics, namely that the reaction takes place slowly but continuously for a long period. Thus the strength of a structural quality concrete containing "good" fly ash in the proportion of about one-fifth of the weight of cement, will increase materially after the usual 28-day test period. Conversely, the strength at early ages will approximate that to be expected from the net cement content.

For a normal structural quality mix of 5 or 5½ sacks of cement per cubic yard, it is common to reduce the cement by 20 to 25 percent when a replacement by fly ash is used. The quantity of fly ash is frequently pound for pound of cement reduction; but it has been found in many instances that the use of 1½ lb. of fly ash for one pound of cement will produce substantially the same strength at 28 days as with the original full quantity of cement. This means the use of 141 lb. of fly ash for one sack of cement omitted. The aggregates in such a mix should be redesigned (usually by reducing the sand) to maintain the same absolute volume of materials.

The accompanying charts shows typical strength curves at ages up to one year for mixes of 5½ sacks of cement and 4½ sacks of cement plus 141 lb. of a good fly ash. These graphs show approximately the same strength at 28 days for both mixes, and also show the considerable increase in strength of the mix containing fly ash from 5,000 p.s.i. at 28 days to 7,400 p.s.i. at one year. These test specimens were cured in the moist room at 73 deg. F. The fly ash used had a loss on ignition of 2½ percent.[2]

The following data are abstracted from the results of a series of tests with various cement contents and various fly ash additions, as reported by D. L. Bloem in N.R.M.C.A. Pub. No. 48.

Sacks per Cu. Yd.		Compressive Strength (p.s.i.)		
Cement	Fly Ash	7 days	28 days	3 mos.
3.5	0	1300	2250	2700
3.5	1	1545	2730	3615
3.5	2	1805	3320	4830
3.5	3	1925	3615	5320
4.5	0	2435	3775	4015
4.5	1	2905	4605	5545
4.5	2	3010	4745	6395
5.5	0	3690	5125	5705
5.5	1	3900	5565	7000
5.5	2	3865	5700	7165

These results indicate two characteristics: first, that the addition of fly ash at much over 20 percent of the weight of cement increases the 28-day strength only nominally; and second, that the growth in strength between 28 days and 3 months is much greater for the fly ash additions than for cement alone. The latter result is similar to that shown in the chart, as discussed above, which is due to the long-time pozzolanic action of the fly ash.

Several other characteristics resulting from the use of fly ash in concrete mixes are to be noted. One refers to air-entraining admixes; it has been the usual experience that to obtain a given air-entrainment, about double the quantity of A.E. admix is required as with cement alone. As regards durability, Mr. Bloem in Pub. No. 48 states, "It does not appear that fly ash is significantly beneficial or detrimental, in itself, to the freezing-and-thawing resistance of concrete." However, some who have observed the service performance of fly ash concrete recommend that if such concrete is to be subjected to weather exposure, it should contain entrained air.

Another characteristic of fly ash concrete is that the development of strength is accelerated at temperatures above normal; thus curing at 100 deg. F. for 28 days will usually produce a strength about equal to that developed in 90 days at normal 73 deg. F. Such performance has been termed "pozzolanic index." (Incidentally, at present there is no A.S.T.M. specification covering pozzolans, either natural or artificial; this includes fly ash intended for use as a partial replacement of cement in concrete. It is understood that an A.S.T.M. committee is considering the writing of separate specifications for natural and artificial pozzolans, and that the "pozzolanic index" idea may be advanced as a means of shortening the time required for testing a material for acceptance.)

The carbon content of fly ashes from different power plants varies considerably, due to the nature of the coal supply, the temperature of the firebox, and other details of the boiler operation. The range of carbon may be from ½ to 30 percent, although "good" ashes usually run below 12 percent. As for the effect of carbon on the concrete, Professor Raymond E. Davis, in a paper on *Use of Pozzolans in Concrete*,[3] says, "Generally speaking, where fly ash is used as a cement replacement up to 30 percent by weight, the lower its carbon content and the higher its fineness the lower will be the water requirements of fresh concrete, the higher will be the compressive strength at all ages, and the lower will be the drying shrinkage."

The handling of fly ash at a ready-mix or a concrete products plant involves special problems because of its extremely fine, dusty character. For any regular use of fly ash, bulk handling and storage are almost imperative. This means additional storage facilities similar to those for bulk cement. The actual batching can be handled over the same hopper and scale as the cement, with special care that the cut-off gates are really tight, as the powdery fly ash may leak through extremely small openings. The cost of the additional storage should be taken into account in considering the economy of using a fly ash blend for concrete.

In short, there are fly ashes and fly ashes. Some have excellent pozzolanic properties which offer a possibility of marked economies when blended with cement in the proportion of about 1 to 4, provided that the cost at the plant is lower than that of cement, without impairing the 28-day strength and other properties of the concrete. But a concrete producer would be well advised if he checks thoroughly the quality of the fly ash he is considering, even at the expense of some delay in having tests made to verify the properties on which he is relying.

Editor's note—A companion article on the use of fly ash in precast concrete products will be published.

[2] *Effect of Curing Condition on Compressive Strength of Concrete Test Specimens*, D. L. Bloem, N.R.M.C.A. Pub. No. 53.

[3] *Journal of American Concrete Institute*, January, 1950.

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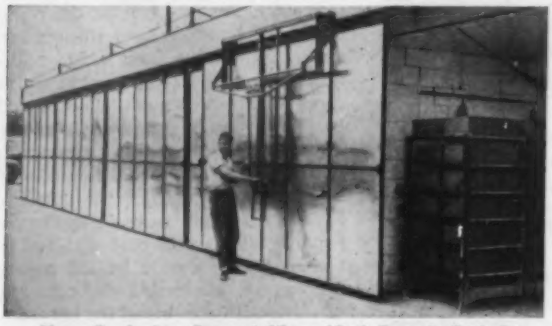

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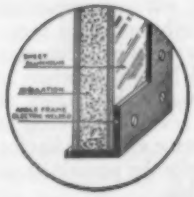

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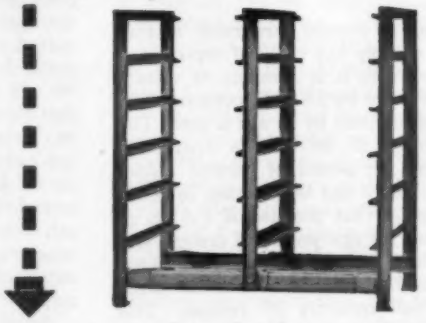

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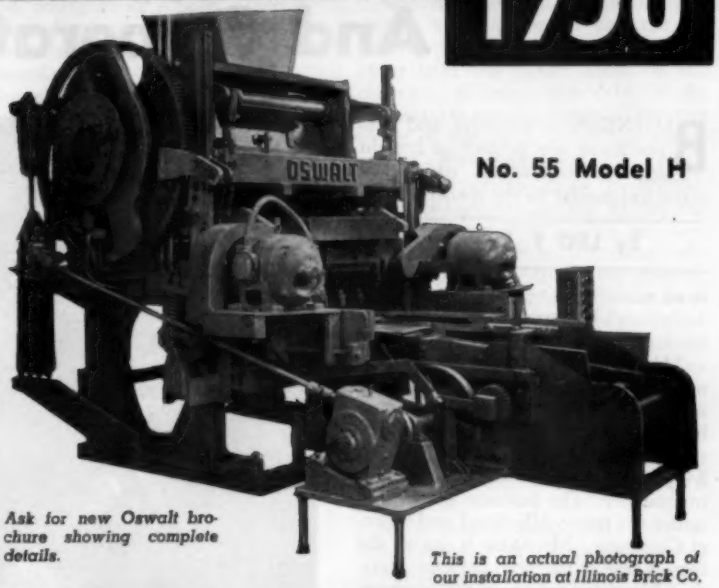

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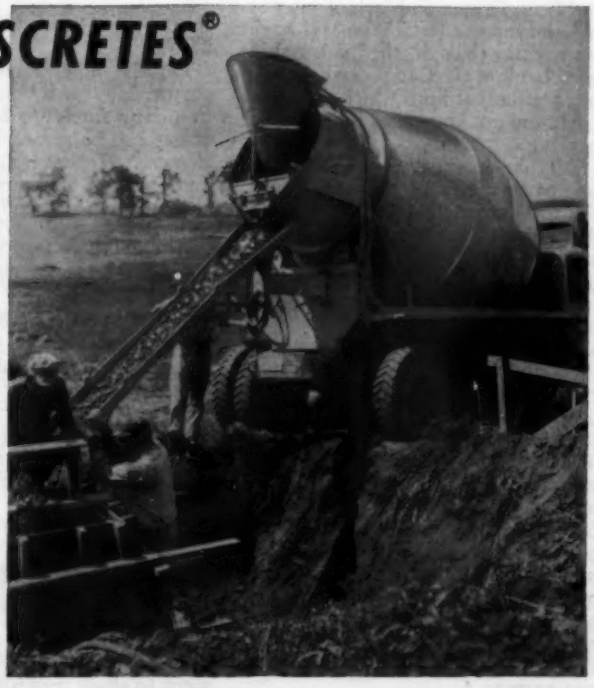

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Legal Aspects Of Partnerships And Corporations

BUSINESS partnerships and corporations are subject to certain legal considerations which are often unfamiliar to the owners. Here

By LEO T. PARKER

is an example. The owner of a sand-and-gravel business reported the following situation:

"About 18 months ago a man named Allis wanted to go into business with me. He had no finances but was an experienced man in the sand and gravel business. I invested $40,000 in this business, making Allis my partner. The business is operated under the name Allis Sand and Gravel Company. My name is not in the firm name, and few persons know that I invested money in this partnership. The deal has not proved satisfactory. First, Allis appropriated $2,000 without my consent. Can I have him arrested and prosecuted for embezzlement? Second, the business due to his negligence and lack of interest is losing money fast. Who will have to pay the bills if the partnership goes bankrupt? Can I save myself by proving that firms which extended credit did not know that I am a partner?"

All higher courts agree that the one partner may be required to pay the total amount of the partnership debts although it greatly exceeds the assets of the business. On the other hand, if a business is incorporated for, say, $20,000, the holder of judgments for a larger sum is limited to a recovery of $20,000 irrespective of the financial status of the incorporators of the business. Hence, partnerships have many glaring and distinctive defects and disadvantages. The most glaring one is that if only one partner is financially responsible, he is obligated to pay all debts incurred in the operation of the business, although such debts are authorized solely by a partner who has little or no financial investment in the partnership. Also, a single partner may be held solely liable for debts of the partnership, although he is a silent partner.

All courts hold that any partner who embezzles or steals funds from a partnership cannot be prosecuted for embezzlement. This is so because a partner is an owner in the partnership. (See Hoose, 205 S. W. (2d) 875).

Leo T. Parker

On the other hand, if no valid partnership exists, one who misappropriates funds for his personal interests can be prosecuted for embezzlement. Hence, it is important to know when a partnership agreement results in a valid and legal partnership.

A valid and legal partnership is formed under the following conditions:

1. Both parties agree to contribute "something" of value to the business. This "something" may be capital, property, chattels, or personal services.

2. Both parties agree to share in all the profits. It makes no difference what proportion of the profits each receives.

3. Both parties agree to share in all the losses.

4. The parties intended to form a partnership.

Only under these circumstances is a legal partnership formed.

The courts hold that a mere agreement to share profits and losses does not constitute a valid partnership if the testimony shows that no partnership was intended or created. A jury may decide whether a valid partnership existed.

A partnership may be implied by the courts, and persons who do not intend to be partners may be liable for the obligations assumed by the partnership. For illustration, the law often implies that a partnership exists for the sole purpose of holding a person who has assets liable for the debts created in the business venture. This may be accomplished if a person who is not actually a partner permits a partnership to use his name, or when he performs any other act which leads creditors to believe that he is financially responsible for the debts of the business.

If no debts or obligations are incurred by a partnership business, or the members did not intend to form a partnership business, there is no necessity of the law implying that a partnership is in existence. When a court interprets an agreement or contract to determine whether a partnership exists, as between the parties themselves, the prior agreement of the parties always controls. And if a person merely lends his name to a partnership business, he is not ordinarily a legal partner with respect to the other partners, although he may be liable for debts of the partnership.

Another important point of the established law is that any one partner may bind all other parties on a debt or obligation, which relates to the partnership business.

For instance, in one case a partner, who had no money invested, without knowledge of any of the other partners signed a contract relating to the business. All of the other partners were held liable on the contract, which resulted in heavy financial loss to the partnership.

Any act or contract of a partner performed within the scope of the partnership business is legally equivalent to the act or contract being approved by all partners. In other words, although a partnership is composed of several members, any one of the partners has exactly the same authority to bind the partnership firm to the same extent as an individual owner of a business may obligate himself.

Obviously, however, a partnership business is not bound by debts incurred by a partner when such debts are not relating to the partnership

business. For instance, a partner in a quarry business borrowed $10,000 which he appropriated to his own use. The partnership was held not liable for the debt because the money was not used in the quarry business.

In another case a partner while supervising the construction of a theatre, purchased a large quantity of brick which he used in the construction of his personal residence. In this case, also, the higher court held the partnership not liable for payment of the debt for the brick.

Many states have enacted laws under which limited partnerships may be formed. Partnerships organized under these laws are restricted to an extent, and the partners' liabilities may be limited to specified amounts. Notwithstanding the advantages of organizing a partnership business under these laws, very few limited partnerships are in existence. Probably the reason is that few persons know that laws of this nature have been enacted in the different states.

Generally speaking, the expense of organizing a limited partnership, by which the liabilities of the partnership is limited, is considerably less than required to organize a corporation. However, the additional expense and trouble usually is justifiable because a corporation has distinct advantages over a partnership.

One advantage of incorporating a business is that a corporation never is liable for any act of an employee done outside the scope of the employment, or for contracts not within the scope of the business as defined by the corporation's charter, or for contracts not authorized by the directors. Moreover, any person who transacts business with a corporation is bound to know that the official or employee who assumes to represent the company is legally authorized to bind the corporation.

It is also important to know that while an individual is liable for contracts made by an employee who acts within the scope of the employment, and a partnership is liable for all acts of all partners within the scope of the business, *a corporation is not liable for contracts made by an employee who acts within the scope of his employment and within the scope of the business, but outside the scope of the corporation's charter.* In fact, corporations are not liable for obligations created by contracts signed by duly elected officers, unless the subject matter of the obligations may fairly be construed as being within the scope of the corporation's charter. Moreover, a corporation is not liable for unauthorized contracts made by its officers, particularly where the company is not benefitted. (114 So. 444.)

On the other hand, a corporation is liable for unauthorized acts of any agent, employee or officer, if the directors of the corporation ratify the agreement, or permit the corporation to benefit by it.

For example, in a leading case it was disclosed that the directors of a corporation adopted a resolution to perform certain business acts of unusual importance without obtaining the stockholders' approval and without entering the resolution on the books. A mortgage was given on the company's real property to secure the assumed obligation.

Subsequently, the corporation contested the validity of the mortgage on the grounds that the transaction was not legal because it had not been properly authorized. However, the court held the holder of the mortgage entitled to payment, stating the law as follows:

"A corporation which has received the consideration of a contract is not allowed to defend against an action of the contract on the grounds that the provisions of its charter . . . were not complied with by the officer acting for the corporation in the execution of the contract."

An important advantage of incorporating a business is that the corporation's credit is firmly and quickly established, because it is comparatively simple for credit associations to obtain dependable reports of the financial status of a corporation, since its books are open for inspection and a detailed report of the profits and losses is rendered regularly.

Moreover, the stockholders ordinarily may lose nothing in excess of their actual investment in the stock, if the company becomes insolvent, whereas individuals and partners, who own a business, are responsible for all debts.

Furthermore, if a business failure does not result from fraud, the credit and reputation of the individual stockholders is not in the least affected by reason of the corporation's inability to meet its financial obligations, as is invariably the case if an individual or a partnership encounters financial disaster. The reason for this well settled rule of the law is that a corporation is a legal entity, distinct from its stockholders. (215 N.W. 855.)

While under ordinary circumstances a stockholder in a corporation is not liable or responsible for losses greater than the value of the stock owned, yet stockholders may make a valid contract to bind themselves personally for the debts of the corporation, in excess of the stock valuation.

For illustration, in the leading case of *Thomas v. Pearson*, 260 Pac. 623, it was disclosed that a stockholder signed a guarantee to pay the indebtedness of the company. The court held the signer liable on the contract, although the debt of the corporation greatly exceeded the par value of the stock which the signer owned. This court said:

"In the present action the defendant (stockholder) agreed to pay the money in order to enable the corporation in which he was financially interested to pay the debts guaranteed by him and to continue in business. He was agreeing to invest his money in a business enterprise."

Although a corporation has many and distinct advantages over either an individual or partnership business, there are many disadvantages and risks incurred in changing from individual or partner ownership to a corporation.

An individual owner who incorporates his business positively releases personal control of it. However, although a corporation may show an intention to be dissolved, it remains in existence unless the proper legal procedure is followed.

For example, in a leading case (160 N. E. 434) it was disclosed that a corporation discontinued its business through a vote of its directors. About six months later the treasurer, director, and general manager, who owned all but two shares of stock in the company, reopened the business at another address without authority of the directors. The court promptly held that operation of the new business was illegal.

An individual who incorporates his business automatically relinquishes his right of the managership without proper authorization from the directors. However, the owner of a plant who retains a controlling interest and voting power of stock in his incorporated business may manipulate the affairs of the corporation in substantially the same manner as though he were an individual owner, particularly if he retains the good will of the directors.

Another disadvantage of an incorporated business is that certain formalities, such as meetings of the directors, election of the officers, distribution of the profits and dividends, keeping accurate book accounts, and the like must be followed in strict accordance with the law. Furthermore, authorization of unusual expenditures must be made by the proper officers, very often at considerable inconvenience.

Individual ownership of a business has the disadvantage that in case of financial disaster, the sole owner must bear the total loss. In an ordinary partnership business the partners bear the loss equally, to the extent of their financial worth, and in a corporation the owners of stock suffer financial loss equal to their respective investments in stock.

Since an individual business owner must rely upon employees to represent him in many business transactions, it is advisable to review the law of employees.

The law recognizes two classes of employees, namely, general and special. A manager, for example, is a general agent, because he is employed to perform all duties necessary to the successful conducting of the business. A special agent is a common employee whose authority is limited to the performance of a special kind of service for his employer.

An employer is liable only for such acts of a special agent which are performed within the scope of the authority given him by his employer. On the other hand, a manager may bind an individual by all of his acts, contracts, etc., which are within the general scope of the business.

However, the legal authority of the manager may be limited if the business owner or any partner notifies the parties and firms dealing with the manager of any special limitations of his authority.

Of course, a business owner may require employees to furnish bond guaranteeing their honesty, and by this method the individual owner's responsibilities and chances for loss is greatly reduced.

A single financially responsible partner is liable for all debts incurred by the partnership, whether or not such debts are incurred with his knowledge and consent. Modern higher courts consistently hold that a financially responsible person who enters a business intending to incorporate the business is liable as a full and legal partner. This is so although no partnership was agreed on.

For example, in *Holzer v. Reynolds,* 43 So. (2d) 169, the testimony shows these facts: One Reynolds required financial assistance and asked a man named Marshall to assist him financially. Marshall paid some of the outstanding debts of Reynolds and advanced or loaned him additional money, under an agreement that the business would be incorporated.

Later certain creditors of Reynolds sued Marshall for the full amount due on debts contracted by Reynolds. Marshall denied any liability on the grounds that he was not a partner of Reynolds, but the higher court held Marshall liable for all debts and sale contracts made by Reynolds, and said:

"Marshall maintains that, as a matter of law, there was never any partnership because there was never any agreement between himself and Reynolds that they would form a partnership. He (Marshall) has overlooked entirely the well established principle of law that where several persons agree to form a corporation and, pending incorporation, conduct a business for which the corporation is to be organized, during that period they are partners."

In *Lind v. Senton,* 10 La. App. 633, 120 So. 535, three persons took the initial steps towards incorporation of a partnership which was never consummated. However, these three persons carried on the business which they had intended should be incorporated.

In subsequent litigation, the higher court held that the financially responsible person was liable for debts and other liabilities assumed by other members of the firm which never was incorporated.

A certain plant operator presents this problem: "Last winter an employee named Willis, who had been with me for many years, intended to accept an offer to manage a competitive business. In order to induce him to stay with me, I took him in as my partner and gave him a small interest in my business. It seems that he lost considerable money at gambling and failed to account to me for money which he took out of the receipts. Also, Willis incurred many debts in the operation of the business, while I was under the impression that these debts were being paid by him from the cash receipts. These various creditors are suing me. Am I liable, and can I prosecute Willis for stealing money from the partnership business?"

According to decisions of the higher courts, a partner cannot be prosecuted for stealing from the partnership. Also, any solvent partner is liable for payment of all debts and obligations assumed by any other partner in the ordinary operation of the partnership business.

The reason for this law is that the court considers each partner legally a "general" agent for the partnership business, impliedly authorized to complete any and all transactions relating to the business without authority or consent of the other partner(s). Moreover, since a partner has a financial interest in the business, he cannot be prosecuted for stealing or appropriating money because the law assumes that a person cannot steal from himself.

Obviously, all of the capital and money may be supplied by one of the partners, and the other partners may constribute skill, labor, or services. However, each partner is individually and personally liable for all debts of the partnership business incurred by any and all of the partners.

For example, one partner named Todd invested $15,000 in a quarry business. The other partner had no money to invest, but agreed to supply his services and manage the business. The partnership business was not successful, and became indebted to the amount of $9,000 above its assets. In this case Todd, who had invested $15,000, was wealthy and therefore he was held liable for the full amount of the liabilities of $9,000 to the creditors, since the other partner had no money.

It is well established law that a legal partnership never exists unless there is a definite understanding and agreement between the partners that all will share in the profits and losses.

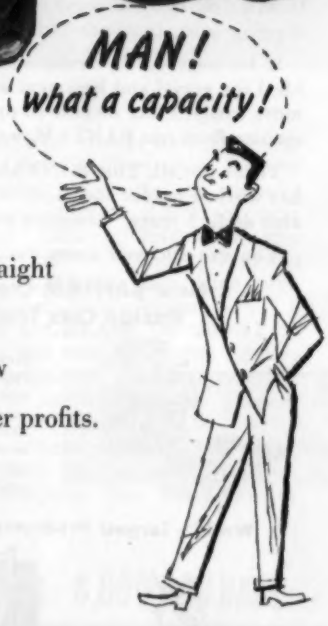
For example, in *Petty v. Sexton,* 206 Pac. (2d) 573, the testimony showed facts, as follows: One Sexton was engaged in business as a building contractor and was badly in need of brick or concrete blocks with which to build houses. He entered into a business agreement with one Stewart, who was engaged in the business of manufacturing concrete blocks, to purchase his entire output at the market price.

Being short of funds, Stewart requested Sexton to pay certain outstanding obligations including rent, weekly payroll, and certain materials. Stewart agreed to repay Sexton in concrete blocks. These various advances were made by Sexton, but the business of manufacturing concrete blocks was a failure. Stewart closed the plant while still owing considerable money for machinery, materials, etc., which he had purchased before the concrete block and brick business failed. These various creditors sued Sexton for payment, contending that he was liable as a partner in the business.

Since no proof was given that Stewart had agreed to share profits with Sexton, the higher court held Sexton not liable for payment of debts incurred by the alleged partnership. The court said:

"There is nothing in the evidence from which an inference can be drawn that Sexton was to share in the profits of the business."

In another case, *Elliott v. National*



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Corporation, 24 S. E. (2d) 605, a seller sued a man named Elliott to recover $1,496.01. Elliott was a partner in a business when the suit was filed. However, Elliott was held not liable because the debt had been created before he had become a legal partner, and he had not represented that he was a partner.

For further comparison, see *American Furnace Company v. Great Southern,* 16 So. (2d) 140. Here it was shown that a person named Neeley furnished capital for a firm, and prepared and signed the partnership's financial statement, on faith of which a seller extended credit.

In subsequent litigation the higher court held Neeley full liable to the seller, although the testimony showed that actually Neeley was not a partner in the business.

And also, in *Taylor v. King,* 31 S. E. (2d) 260, it was shown that an employee and the owner of a business entered into a written contract by the terms of which 25 percent of the gross receipts was to be paid to the business owner by the employee as rental for certain equipment.

In the subsequent suit the higher court held that the lease created a relation of landlord and tenant and not a partnership.

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A grant of $11,500 has been awarded to the Missouri School of Mines and Metallurgy by the Missouri State Highway Commission and the United States Bureau of Public Roads for the study of the effects prestressing will have upon thin concrete paving slabs.

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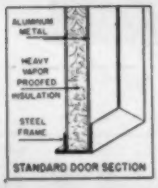

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Recent exhaustive market studies have proven so encouraging that the St. Lawrence Cement Company has decided to double the capacity of its plant-in-construction at Clarkson, near Toronto. Scheduled 1957 production of this plant is now set at 12,000,000 bags of Portland cement, a total of 18,000,000 bags when combined with the Quebec plant's output.

A TWO-YEAR INCREASE OF 200%!

The Clarkson plant will start production January 1, 1957. Its huge production will most certainly eliminate all cement shortages in the Toronto area and in the rest of Ontario.

Eastern Canada's cement shortages are being overcome spectacularly by Canada's most progressive cement company,. the St. Lawrence Cement Company.

1955 PRODUCTION: 6,000,000 BAGS

1957 PRODUCTION: 18,000,000 BAGS

ST. LAWRENCE CEMENT CO.

CM New Machinery and Supplies

● Foremost characteristic changes in the latest Jaeger standard Model "D" truck mixers are a shortened center of gravity, reduced weight, a 3-speed transmission, and a complete choice of optional equipment. Sizes range from 3½ to 8½ cu. yd., with legal payloads of 3 to 3½ yd. on single axle models and 4 to 4½ on the lightest tandems. The 3-speed transmission offers a range from 2 rpm drum speed per 1,000 rpm engine to 17 rpm per 2,000 rpm. Also added are 25 percent larger discharge blades ▲ (101)

● Link-Belt Speeder Corporation is now offering five new truck-crane models from 12½ to 35-ton lifting capacity. Called Zephycranes because of their mobility, they feature Speed-O-Matic, which enables the operator to manipulate all working operations with a minimum of effort. Small models, 12½ to 17½-ton capacity, are all-purpose cranes for lifting and digging, while the 25, 30 and 35-ton units are primarily erection rigs. ▲ (102)

● Safety and performance devices are features of the Moto-Bug, now manufactured by the Kwik-Mix Company, subsidiary of Koehring Company. An intricate brake system, soft-core tires, a cog-type V-belt furnishing transmission power, a vertical clutch control, the 3 ft. 6 in. height of the steering wheel, and a built-in starter are the innovations featured in the Moto-Bug. Easy handling is maintained by the narrow width of 33 in., the short turning radius, tricycle balance, and large capacity. ▲ (103)

● Steelcase Strandvise anchors, developed by the Reliable Electric Company, have two outstanding features for the concrete manufacturer and builder. First, they are designed to hold steel strand, and/or rod under tension up to 18,000 lb. during the manufacturing process, and secondly, they are reusable. ▲ (104)

JANUARY, 1956

MORE INFORMATION PLEASE

THE CONCRETE MANUFACTURER
431 S. DEARBORN ST.
CHICAGO 5, ILLINOIS

Please send more information on items described in editorial columns of this issue, as circled below.

101 102 103 104 105 106 107 108 109 110
111 112 113 114 115 116 117 118 119 120
121 122 123

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

Another BESSER Booster*

* This is the 126th of a series of ads featuring leaders of the Concrete Products Industry who are stepping up block production with Besser Vibrapac machines.

Schuster Block Company executives: R. C. Brown, plant superintendent; C. W. Braughton, owner; and James F. Harris, general superintendent.

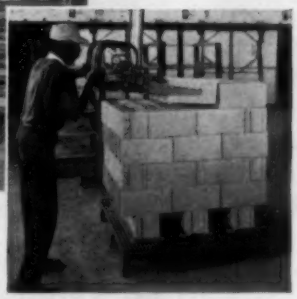
"There's No Machine on the Market Today that will Stand Up to a BESSER"

These words came from James F. Harris, General Superintendent of Schuster Block Company, Indianapolis, Indiana. Mr. Harris has had considerable experience in the block industry. His high regard for the Besser Vibrapac is reflected in the fact, he recently referred to the Vibrapac as the "Workhorse" of the Industry.

The Schuster Company started in the block business in 1918 with a hand machine. Their first Besser machine was purchased in 1941. This was followed by a Vibrapac machine in 1948, and, as business progressed, two more Vibrapacs were added in 1953, replacing the older models.

Early this year, the Schuster plant was completely gutted by a disastrous fire. Undaunted, the company rebuilt the plant from the ground up, and significantly, equipped the new plant with two new automatic Vibrapacs and two Besser 50 cu. ft. mixers. Within 90 days of the date of the fire, these machines were producing block. Currently, production runs to 18,000 (8" or equivalent) units per day.

One of the two new automatic Vibrapac machines installed in the new Schuster plant. The illustration shows off-bearer removing the green block with the help of a Besser Power Hoist.



The new Schuster plant is a model in block plant design. It is equipped with the most modern facilities, including automatic control devices to increase production with a minimum of manpower.

Before you invest in new block making equipment, be sure to get the complete Vibrapac story . . . from the Besser representative in your locality . . . or write directly to

BESSER COMPANY
BOX 131 • ALPENA, MICHIGAN, U. S. A.
Complete Equipment for Concrete Block Plants

Note Cubing Station in photo (above, right). Besser Bridge Crane Block Cuber eliminates lifting block by hand . . . simplifies inventory count . . . permits neat stockpiling. Besser Cubing Platform, with open steel grating, is self-cleaning.

Yard scene at Schuster plant. Note neat stockpiles due to block cubing. A covered storage is planned for the near future.

The new Schuster block plant, built on an adjacent 16-acre site, south of the old plant destroyed by fire.

BESSER VIBRAPAC

First in Concrete Block Machines!

A 8569-1PBC

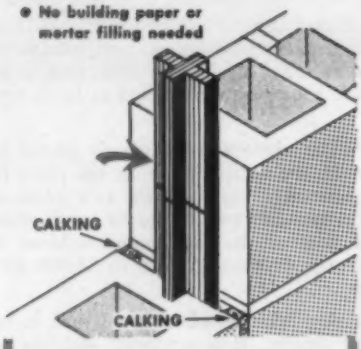
SELL

BLOK-JOINT

Patents Pending

for masonry wall CONTROL JOINTS

- BLOK-JOINT may be used with any standard metal window sash block—no special blocks necessary!
- No cutting or sawing
- No building paper or mortar filling needed



INCREASING DEMAND ASSURES INCREASED VOLUME! More and more the use of control joints is being recommended in erecting masonry walls.

Carter-Waters BLOK-JOINT is a "cross-shaped" rubber extrusion which greatly simplifies the construction of masonry wall control joints. Made of "100 year life" rubber, it forms a secure interlock and adds stability to the wall.

VERSATILE! BLOK - JOINT is easily adapted to various types of wall construction—block walls, brick with block back-up, cavity walls and others.

DEALERS:
Write TODAY for information about a profitable BLOK-JOINT dealership in your territory!

WRITE TODAY for FREE sample! Just fill in this coupon—

Carter-Waters Corporation
2440 Pennway, Kansas City 8, Missouri

Please send me a FREE sample and specifications on the new Carter-Waters BLOK-JOINT.

Name_____

Address_____

City_____ State_____

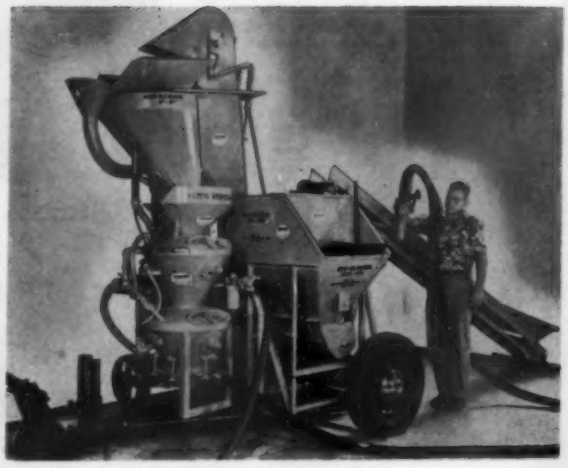
CONSTRUCTION THE MATERIALS
CARTER-WATERS
KANSAS CITY 8 MISSOURI

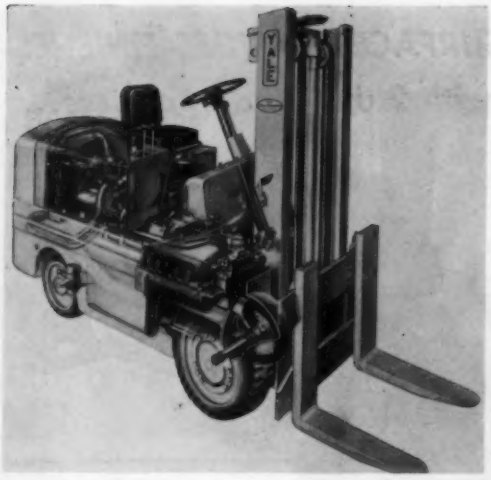
2440 Pennway Phone GRand 2570

● The TC-200, newest in the line of lift trucks manufactured by the Hyster Company, makes available a lift with a capacity of 20,000 lb. at 24 in. load centers. Gasoline powered with the Hercules industrial engine, or the optional Perkins P6 diesel motor, the TC-20 has a speed of 20 mph in either forward or reverse. Compact design, 166½ in. long and 94 in. wide, the center-point steering allows a sharp outside turning radius of 179 in., creating a high degree of maneuverability. ▲ (105)

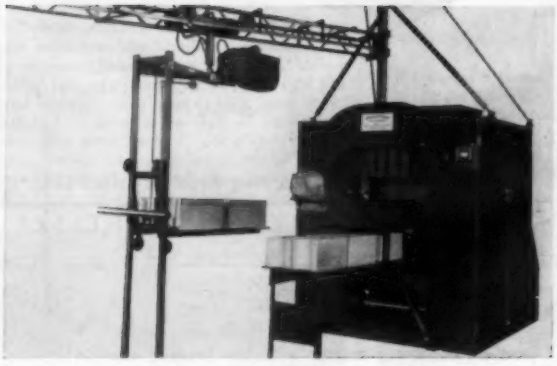
● The S & M Manufacturing Company now makes available a 4 cu. yd. agitator for handling central mixed concrete. Meeting all ASTM specifications, the body is streamlined and is easy to clean out. Handling either dry or very wet concrete, the AGITOR features a wide chute which is entirely power-operated, including the fold-up process. Loaded in a matter of seconds, the AGITOR can discharge 4 cu. yd. of concrete in just 15 seconds. ◀ (106)

● The Air Placement Equipment Company has started production of a new portable concrete gunning rig. Patterned after the company's older model rig, many new features have been added to increase completeness, capacity and flexibility of the unit. Constructed in three basic pieces, the Nucretor concrete gun, the Mix Elevator automatic proportioning, dry mixing and elevating machine, and the sand loader, the rig is versatile in its use. ➔ (107)





● A new series of industrial lift trucks manufactured by the Yale and Towne Manufacturing Company, the KGA51 Series, are equipped with the Yale Torque Transmission which provides fully automatic gear shifting. With built in capacities from 3,000 to 8,000 lb., the trucks feature the latest fork design. Powered by gas, diesel and LPG engines, every truck in the KGA51 Series has an inching control for more accurate maneuvering. ← (108)



● The "Thunderbolt" Plain Pallet Block Machine, newest of its kind in the field, is now in production at the Praschak Machine Company. "Thunderbolts" are equipped with such outstanding features as positive height control, variable dual vibration and automatic density control. Capacity of this machine is more than 480 concrete blocks per hour, more on lighter weights. Block size is 18 in. by 18¼ in., but can be varied with the touch of a dial. ← (110)

● A new line of residential and commercial steel doors is being produced by the Steelcraft Manufacturing Company. Featuring 1¾ in. doors for hotels, motels, office buildings and institutions, the 1⅜ in. door is manufactured for use in apartments, housing projects and homes. Glass panels, vision lites and louvers as well as a baked-on prime finish or a choice of colors are also available ↑ (109)

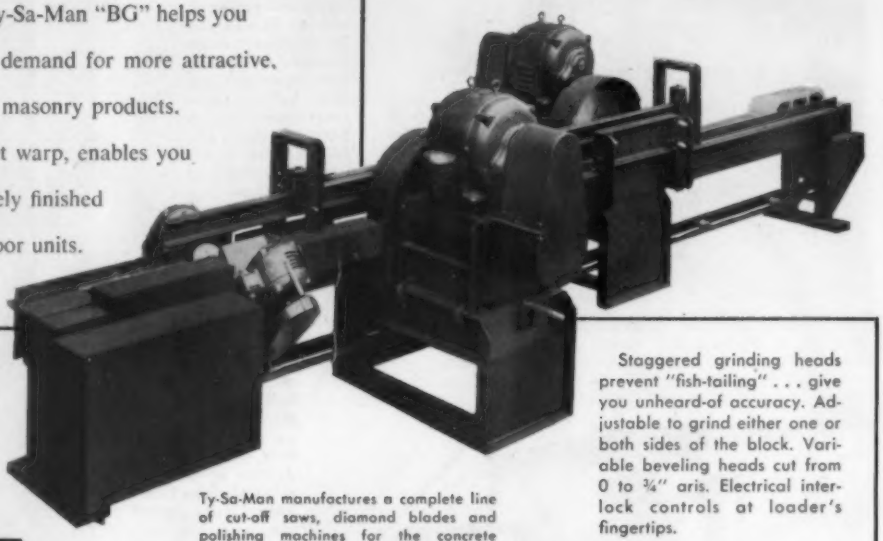
● Among the many new features of the Trac-Lift 50, made by the International Harvester Company, the Model 50 speeds up lifting, transporting, stacking, loading and unloading while handling up to 5,000 lb. An 11 in. under clearance, plus new power and traction, permit the Trac-Lift 50 to be used in all seasons and on rough surfaces. With power steering any hydraulic clutch and brakes, it has five forward speeds and one reverse, with a road speed of 20 mph. ↑ (111)

● The new Yale Model A hand truck, a pallet handler of 2,000 lb. capacity and manufactured by the Yale and Towne Manufacturing Company, features light weight, easy maneuverability and increased underclearance. Model A lifts a pallet four in. from the ground with nine foot pedal strokes and can be built to handle standard pallets of 30 to 70 in. in six in. increments. Standard overall fork widths are 24, 27 and 30 in. ↑ (112)

AMAZING TY-SA-MAN "BG"... *GRINDS-SURFACES-GAUGES-FINISHES-*

& BEVELS 10 blocks per minute with 2 unskilled operators...

Low investment Ty-Sa-Man "BG" helps you meet the growing demand for more attractive, precision concrete masonry products. Takes out all pallet warp, enables you to deliver completely finished blocks, roof and floor units.



Staggered grinding heads prevent "fish-tailing" . . . give you unheard-of accuracy. Adjustable to grind either one or both sides of the block. Variable beveling heads cut from 0 to ¾" aris. Electrical interlock controls at loader's fingertips.

WRITE TODAY

For the name of closest installation in your area or for completely illustrated brochures on "BG" Grinders, Saws and Polishers.

Ty-Sa-Man manufactures a complete line of cut-off saws, diamond blades and polishing machines for the concrete masonry industry.

TY-SA-MAN *machine company* "manufacturers of stone working machinery since 1885"

WHITE AVE. AT TENTH ST. • KNOXVILLE, TENNESSEE

PIT and QUARRY Helps You Operate More Profitably

Every issue of PIT AND QUARRY is full of information you can use in your business. It gives you practical ideas on every phase of your operations.

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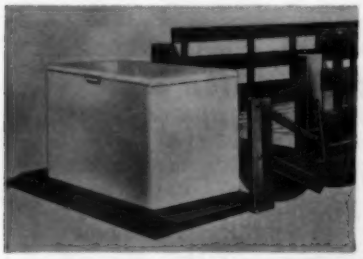
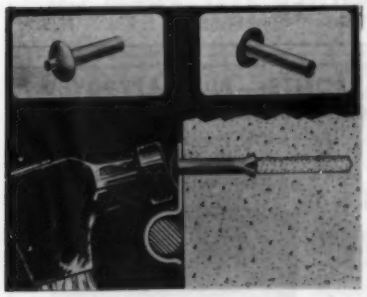
The cost of this service is only $3 a year. Mail your subscription at once.

PIT AND QUARRY PUBLICATIONS, INC.
431 S. DEARBORN ST.
CHICAGO 5, ILL.

● Two new models of working gloves have been added to the Stenflex line, made by the Pioneer Rubber Company. The palm-coated knit wrist model, shown, and a 10 in. band top style, also palm coated, have been designed to allow more than 47 sq. in. of seam free work surface, completely eliminating seams from abrasion points. A compounded plastic coating offers a non-slip satin finish which outwears leather. ▲ (113)



● Hercules Steel Products Company has announced the production of a new 1,100 lb. capacity Load-N-Gate power-life tailgate for use with pick-up, stake or platform truck bodies, on ½, ¾, and 1-ton models. ▲ (114)



● A new fast, low-cost rivet for attaching metal to masonry is now being manufactured by the Southco Division of the South Chester Corporation. The one-piece Southco Masonry Drive Rivet can be used in brick, cinder block, concrete and similar materials. ▲ (115)

"Yes, we'd like to expand our operation," commented Lon Ware, Mexico, Missouri ready-mixed operator, "but I don't want to tie up any more capital in plant equipment."

Then Material Handling, Inc., stepped in, with this answer:

"Look, Lon—we'll supply the plant that'll convert you from bag to bulk cement. Then every time you pay the cement company for a carload, you simply send us a check representing the savings in purchase price between bag and bulk. We'll apply this to your plant."

Final result: Material Handling, Inc.'s bag-to-bulk conversion cost Lon Ware nothing; the savings paid for the plant in just two years, and now the savings between bag and bulk is Lon Ware's profit.

You may do the same, subject to approved credit and a reasonable deposit. If you want to increase *your* profit, send in the coupon today. Or give us a ring. We'll send a man to see you.

material handling, inc.

4987 FYLER AVE., ST. LOUIS 9, MO.
FLanders 2-7800

Affiliate Companies:
Concrete Transport Mixer Co. *St. Louis*
Fleming Manufacturing Co. *Cuba, Mo.*

MATERIAL HANDLING, INC.
4989 Fyler Avenue, St. Louis 9, Missouri

Yes, we're interested. Send us more information on your material handling bag-to-bulk plan.

CM

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FIRM_____

ADDRESS_____

CITY_____ STATE_____

BOOST PROFITS with ALLIED PRODUCTS

BABY GIANT VIBRATING TABLE

A must for all ready-mix and concrete products plants. Directional vibrating—no counter-shafts, V-belts or sheaves. Variety of heavy metal forms available. Make extra profits from left-over "mud" and idle labor.

P & S ELECTRONIC MOISTURE CONTROL

The proven automatic way to insure the same moisture content of every batch. Over 400 installations in block and pipe plants over the country.

MULTIPLE LINTEL FORMS

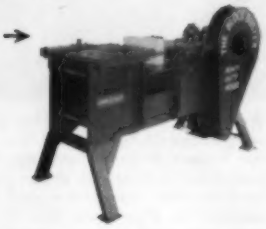
Win over competitors with these multiple lintel forms and vibrating table. Comes complete with stops and air vibrator to produce almost 200 linear feet per pour.

MARVEL DRAIN TILE MACHINE

Produces highest quality tile. Fast—simple—rugged. Inexpensive. Also available in all power Deluxe Model.

THE FINEST IN BLOCK SPLITTERS

With precision performance built in. Extremely fast—Heavy duty—26" extra hard blades. Motor driven—No hydraulics.



COMING SOON!
Futurmatic equipment.

ROY DARDEN INDUSTRIES, INC.

P. O. BOX 95 NORTHSIDE STATION ATLANTA, GA.

for handling
BRICKS, CLAY PRODUCTS

Tufhorse KANT-RIP

HAND PADS
GLOVES
MITTENS

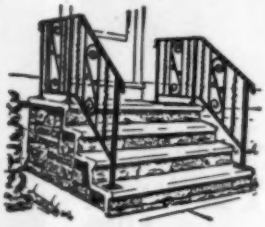
Heavy Split-Cowhide Hand Pad No. 208. Tie back $7.00 per dozen pairs.

Made from the finest cowhide, Tufhorse gloves, hand pads and mittens are comfortable to wear, provide real protection for your hands.

ORDER SAMPLE PAIRS AT "PER-DOZEN" PRICES

DES MOINES GLOVE & MFG. CO.
DES MOINES, IOWA

Here is a step in the right direction



PRE-CAST STEPS AND PORCHES IN STONE OR BRICK

Licensor: **SHAWNEE STEP FORM CO.**
BOX 995 TROY, N.Y.

FOR GREATER PROFITS — BUILD APPROVED CONCRETE SEPTIC TANKS with

NORWALK EQUIPMENT

Build rectangular concrete septic tanks that will meet the most rigid specifications of local health officers and sanitary engineers. Build them QUICKER and at LOWER COST with NORWALK septic tank molds.

• Molds built to your requirements •

Write for details

THE NORWALK VAULT COMPANY
Dept. CM • NORWALK, OHIO

New Literature

B. E. SCOTT of *Thermo Stone Brick*, recently made available a new exposed masonry wall unit which was four-years in the testing stages under the most rigid conditions nature can provide. Proven to be fire proof, damp proof, easy to heat in the winter and a fine insulation against the summer's heat, this new concrete brick is both low in cost and fine in appearance as an exterior covering. Strong, the concrete brick wall unit is reported to have a compressive strength of 2400 lb. per sq. in. per unit. **(116)**

MONARCH DYNA-CHUTE KITS now make handling the heavy mixer chute easy. Elevating the discharge chutes on Transit Mixers in less than 10 seconds, this fast, safe, and automatic hydraulic kit, made by *Monarch Road Machinery Company*, speeds the unloading procedure on all Transit Mixers. The Dyna-Chute is built to raise a ton or more. **(117)**

QUICK OPENING DOORS are the subject covered in an eight-page bulletin published by *Struthers Wells Corporation*. Automatic or semi-automatic in operation, these units are available in Ring-Lok and Wedg-Lok types. They are recommended for vulcanizers, devulcanizers, impregnators, sterilizers, cement block curing vessels, ovens, and creosoting cylinders. An outstanding feature of these doors is a safety system by which an electro-pneumatic device prevents either type door being opened when as little as six ounces of pressure remain inside the vessel. **(118)**

T-LOCK AMER-PLATE SEWER LINING, the continuous plastic sewer lining, is fully described in a new brochure published by the manufacturer, *Amercoat Corporation*. The brochure contains 16 photographs and is printed in two colors with complete information on the composition, physical and chemical properties, and the method of incorporating T-LOCK lining in precast and cast-in-place concrete sewer pipe and structures. **(119)**

DOME-SHAPED LIDS for large truck trailers hauling dry cement are being made by the *Commercial Plastics Company*. Made of glass fiber and Vibrin polyester plastic, the lightweight reinforced plastic domes are 3 ft. high, 11 ft. long, and 8 ft. wide. They are molded in one piece, weigh just 150 lb., and resist rusting, shattering, and warping. **(120)**

PORTABLE CONCRETE TESTING MACHINES, flexure attachments and accessories are described in a bulletin made available by *Soiltest, Inc.* This six-page bulletin also highlights apparatus for the preparation of concrete specimens for strength testing and for slump, yield and air entrainment testing. Detailed illustrations of products and applications, technical descriptions and size and weight specifications are included. **(121)**

HANDLING MATERIALS ILLUSTRATED, published by *Towmotor Corporation*, features a series of interesting case histories in their latest issue which have to do with difficult materials handling problems solved by various companies. All illustrated, the histories cover handling improvements made in receiving, processing, storage and shipping. **(122)**

CONCRETE PIPE FORMS, manufactured in all shapes, sizes, and lengths by the *Quinn Wire and Iron Works*, are completely illustrated and described in their new catalog, "Concrete Pipe Forms." In addition, the catalog contains information on the methods of manufacturing concrete pipe and production suggestions. **(123)**

CONCRETE PLANTS

Save Time and Money and Increase Sales

WITH THE NEW, COMPLETE [SC]² SET-UP

This is what you get:

1. A NEW CONTINUOUS AUTOMATIC METHOD OF MOISTURE DETERMINATION. This uses a high frequency electric current instead of resistance which eliminates most of the variables that make resistance measurement unreliable. It measures moisture content of *both fine and coarse aggregates and also artificial aggregates* to a tolerance of ¼%, through the whole range from 0% to 15%.

The probes are located just above the discharge gates which measures moisture content as the aggregate drops into the weigh hopper. This gives the moisture content of the whole batch rather than that of a selected portion, which happens when the probes are located in the weigh hopper. Moisture content, so measured, can be read from a dial or recorded on a graphic chart.

2. A NEW COMPLETELY AUTOMATIC BATCHING SCALE FOR LARGE PLANTS. Uses [SC]² compensation discs to correct for moisture content. This, with the automatic moisture determination, enables the operator to deliver the dry weight of wet aggregates to a tolerance of ¼%. One push button starts the batching which proceeds automatically to completion. It is the simplest, fastest and most accurate batching scale with moisture compensation that is now available.

3. AN AUTOMATIC GRAPHIC RECORDER that records the delivered weights of aggregates, water and cement on a single chart 10 inches wide, using two different colored inks.

4. A NEW QUICK METHOD OF DETERMINING FINENESS MODULUS. The above equipment is now available on a lease, lease-purchase or straight purchase basis. It will be shown at the N. R. M. C. A. Chicago Convention. Be sure to see it.

For further information write

Scientific Concrete Service Corporation

724 Salem Avenue, Elizabeth 3, N. J.

SCIENTIFIC [SC]² CONCRETE

MOST DEALERS AND BUILDERS PREFER NOT TO USE SUBSTITUTES... *now they Specify Genuine . . .*

DUR-O-WAL

Backbone of Steel for EVERY Masonry Wall

YOU can depend on top performance with genuine Dur-O-waL on the job. Electrically welded of high tensile steel, Dur-O-waL works fast, lays flat to combat cracks in brick, block, or tile masonry. Dur-O-waL's patented trussed design keeps side rods working together; put more steel in the wall economically. Increase sales and customer satisfaction the proven Dur-O-waL way. Demand Dur-O-waL . . . available everywhere.

• Builders everywhere are using Dur-O-waL, the customer-designed reinforcing member that gives masonry walls a backbone of steel. Welded in a single plane, Dur-O-waL assures a tight, neat mortar joint.

Butt-Weld • Trussed Design

DUR-O-WAL

the Backbone of Steel for EVERY masonry wall

SYRACUSE 1, N.Y.	Dur-O-waL Products, Incorporated, Box 628
TOLEDO 5, OHIO	Dur-O-waL, Incorporated, 165 Utah Street
BIRMINGHAM 7, ALA.	Dur-O-waL Products of Ala. Inc., Box 5446
PHOENIX, ARIZ.	Dur-O-waL Div., Frontier Mfg. Co., Box 49
CEDAR RAPIDS, IA.	Dur-O-waL Div., Dept. 655, Cedar Rapids Block Co.

MACE SINTERING HEARTHS

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4 compt.
Mace
Sintering
Hearth

For Production of

LIGHT WEIGHT AGGREGATE

from clays, shale & fly ash

Standard Sizes	Nominal Capacity—L. W. A.
No. 2 — 2 compt.	50 Cu. Yds.
No. 3 — 4 compt.	100 Cu. Yds.
No. 4 — 6 compt.	150 Cu. Yds.
No. 5 — 9 compt.	225 Cu. Yds.
No. 6 — 12 compt.	300 Cu. Yds.

Our Testing Plant is at your service
For further information & literature write

THE MACE COMPANY

2757 Blake St., Denver 5, Colo.

NOW MORE THAN 150 LICENSED MANUFACTURERS *Producing*

Patented
homeward®
***Concrete* STEPS**

A Small Investment That Pays Big Dividends

Homeward all metal forms are precision built to produce a product that requires no hand finishing.

The exclusive franchise for your territory may still be open.

For Complete Information Write
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® homeward is a Registered TRADE MARK.

For Fast Results . . .

ADVERTISE YOUR USED EQUIPMENT

THE CONCRETE MANUFACTURER'S
CLASSIFIED SECTION

"The Marketplace of the Industry"

Block Industry

(*From page* 288)

best) and that the reported figures represent an average of the industry, it would appear that the industry used in the neighborhood of 27 million bbl. of portland cement in 1955. This figure or estimate can be ascertained fairly closely when the latest figures from the Annual Survey of Manufacturers, made by the U. S. Department of Commerce for 1954, is available. There is no doubt that the concrete products industry, in using this great amount of the cement produced each year, has attained a high cement priority. This should be reflected by a better apportionment of the cement output to the industry than it has enjoyed (or suffered) in the last few years.

A practical aspect of the feeling of representative producers of concrete block who gave us data on the subject of cement shortages experienced in 1955, is reflected in the following consensus of about 40 percent of those answering a question as to production loss experienced in 1955. The average loss was stated to have been about 75,000 8-in. equivalent blocks, and the majority felt that the inability to get portland cement at the height of their construction season was mainly responsible for this regrettable restriction of effort.

The use of fly ash in the manufacture of concrete block increased in 1955. Many producers, investigating the advantages of such use, report that where high temperature steam curing is used, and more particularly high pressure steam curing, the use of from 10 to 25 percent fly ash adds a valuable source of silica in the mix. The added plasticity afforded by fly ash in the relatively harsh block mixes seems to provide better finish or texture, longer mold life and truer corners on the units, while maintaining the required strength.

Looking Ahead Output of blocks in 1956 was estimated, by those answering our question as to this future outlook, to be generally good. Of the total replies, 49 percent felt that 1956 production should average about 9 percent above that of 1955. Only 3 percent of the total felt that business would be worse, their estimate being that it might average 3 percent lower. Thirty percent thought that it would remain about the same as in 1955 and 18 percent had no opinion on the subject. The major factors governing the favorable estimates included more construction prospects, cement availability in certain areas, settlement of labor difficulties, increased capacity, and better competitive conditions.

More optimism was exhibited in the South and West than in other sections, mainly due, it appeared, to larger prospective construction in those areas. This is quite natural, considering the shift of manufacturing which has occurred in the southwest in the last ten years.

To meet the expected demand for their products many block men stated that they contemplated increasing the capacity of their plants in 1956. The average for all who contributed opinions on this subject included 77 percent of those answering. These producers estimated that a 17 percent increase of their present capacity would be required, and that such an increase would average about $27,000 per plant affected. This would be accomplished in most cases by adding new equipment or remodeling existing facilities.

Only a comparatively few (14 percent) stated that their market had been restricted in 1955. Reasons given for this were antiquated building codes in certain cities, labor union attitudes in a few instances, progressive competitive practices and cement shortages. Most producers said that research on the subject of cracking in concrete masonry walls would erase many of their troubles.

Miscellaneous Besides the basic commodity — concrete blocks—about half of those answering said that they produce other precast products, the average income from such production accounting for about 8 percent of their total sales volume. These products are mainly concrete lintels and sills, drain tile, septic tanks, garden ornaments, and silo staves. Almost all producers of blocks sell wall reinforcing, cement, lime, steel windows or other allied materials, supplies or equipment to their customers. A few have available for lease such equipment as mortar mixers, hoppers, conveyors, tower hoists or scaffolding. The consensus appears that an appreciable gain in good will, if not always in profits, accrues to the producer who can in any way facilitate the installation of his products in the building.

The use of portland cement in bulk, either in hopper bottom railroad cars or similarly equipped trucks, is gradually increasing in the concrete block industry. Producers reported that 51 percent of their incoming shipments of cement in 1955 came in bulk. This proportion was generally maintained across the country, 54 percent using bulk cement in the North Central plants, 33 percent in the East, 54 percent in the South, and 48 percent in Western plants. It was noted that when bulk cement is used, it generally is used in the entire production of a plant and thus eliminates handling empty cement sacks. The high degree of mechanization which is afforded today in cement handling equipment, for either small or large quantities of cement, makes the use of bulk materials especially expedient.

In reporting as to the average amount spent annually for maintenance of plants, 51 percent of all those reporting stated that this figure is about $12,000. Areawise, this average ranges from the $21,000 estimated expenditures by Eastern plants, $13,600 by the Southern firms, $9,000 by the North Central plants, to the $7,200 spent for maintenance by Western plants.

As to the annual expenditure for advertising and promotion, some 35 percent of the plants reported this item to average $3,600. The average sum spent for this purpose in the different areas was $5,200 in the East, $4,300 in the South, $3,100 in the North Central area, and $2,100 in plants in the West.

Canadian Production Our questionnaire for 1955 data was not sent to concrete products producers located in Canada. However, the following statistics, compiled by the Dominion of Canada Bureau of Statistics for the ten months ending in October, 1955, form an interesting comparison of production of concrete products in our sister country.

These data represent production by 185 of the principal manufacturers which normally account for 85 percent of the total concrete block output, making it an accurate cross-section of the industry. The following quantities of the various items were manufactured:

Concrete brick (numbers)	111,251,669
Concrete blocks, (including chimney blocks)	
(Made with heavy aggregates)	69,797,186
(Made with cinder aggregates)	11,880,981
(Made with other aggregates, such as Haydie, slag, etc.)	7,441,735
Drain tile, sewer pipe, water pipe and culvert tile (tons)	357,429
Ready mixed concrete (cu. yd.)	3,148,089

The above data would indicate that the use of lightweight aggregates in Canada has not reached the proportions of use found in this country.

Concrete Pipe

Rides Construction Trend Upward in 1955

Producers optimistic on highway, housing, drainage programs

By ROY L. PECK

THE concrete pipe industry, closely tied in as it is with the construction industry of the country—which is approaching a $60,000,000,000 annual volume—evidently enjoyed another year of high-level activity in 1955. Production figures received from representative producers indicate that perhaps an 8 percent average increase in business occurred in that year, placing the overall total close to 13,000,000 tons of all sizes and types of concrete pipe produced.

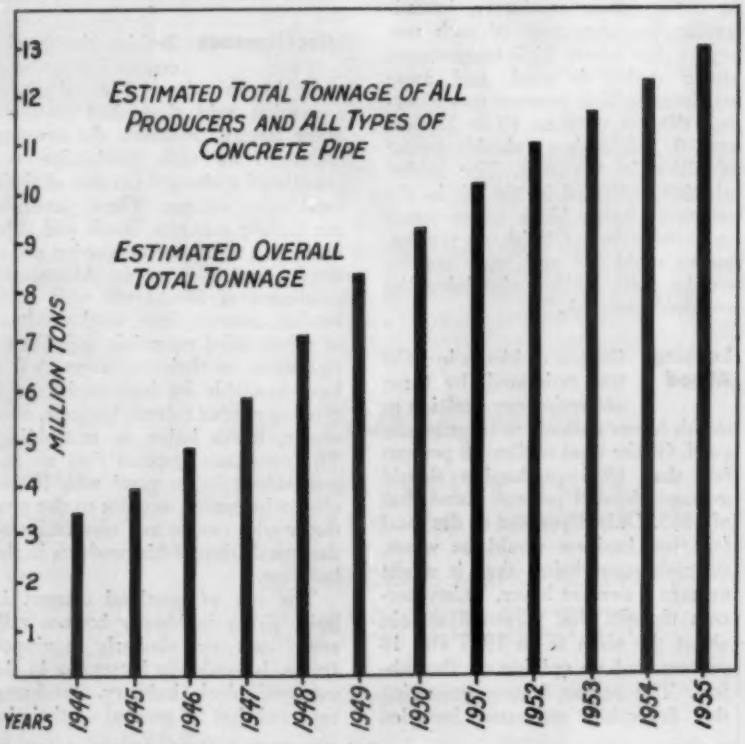
This increase is particularly significant in view of the fact that the national highway program first suggested by the President, has experienced one delay after another during the last year. Many a producer of concrete pipe held high hopes at the start of the year that he could confidently count on the projected program to furnish him with an appreciable share of the material business which such construction necessarily involves. While it was understood that such a tremendous road building would involve numerous initial delays and controversies, it was known that the products of the concrete pipe industry are always the first items to be installed in this type of work. It is to the credit of the producers of pipe that they managed to find other means of obtaining the margin of increase indicated for the year.

When we consider the tremendous impact and change the automobile has brought on our lives in the last decade, we must realize that a road building program of equally significant proportions must be carried out eventually, financed by one means or another. Constructing highways requires pipe in large quantities. Further, as the roads open new areas around cities, the ground work is laid for vast housing projects requiring new sewer and sanitation facilities. Concrete pipe plays a major role in the construction of these. Aside from the highway program, the government continued at an accelerated pace the big program of drainage and irrigation launched the year previous. Other vast projects, designed to eliminate the dangers and nuisance of pollution, planned in 1954, came into being in 1955. This basic government construction instigated much private construction, the true volume of which will be shown in subsequent years.

The last two years have dispelled in large part the bogie of hesitation that adversely influenced decisions by all producers as to future moves for expansion. It would appear that the fear of a catastrophic war, with its resultant disruption of business and construction, has been at least temporarily postponed. The expected transition to a "buyer's market" has likewise dissipated itself in the resumption of more or less normal business, mainly sparked by the extraordinary unexpected increase in population which confounds the experts. It may be a far cry from babies to concrete pipe, but the connecting path is easily discernible to those who would look. In effect, meeting the challenge of change has been healthy for most producers of materials or products used in construction.

With an eye to the more efficient application of these products to the national scale, various government agencies have, during the last year, conducted research and made other study of applicable Federal specifications designed to make these more uniform. Brief mention of certain of those which concern producers of concrete pipe may be of interest.

The Civil Aeronautics Authority, for example, published in March, 1955, a revised table of hydraulic roughness values recognizing and using an "n" value of 0.013 for well laid concrete pipe sewers. The U. S. Corps of Engineers is proceeding with a study of present federal specifications for concrete pipe with a view to possible coming revisions more in line with the A.S.T.M. specifications. This latter body pub-



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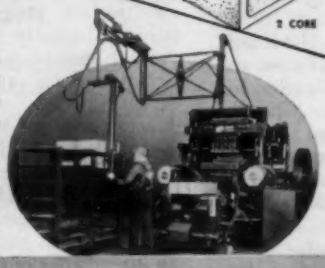

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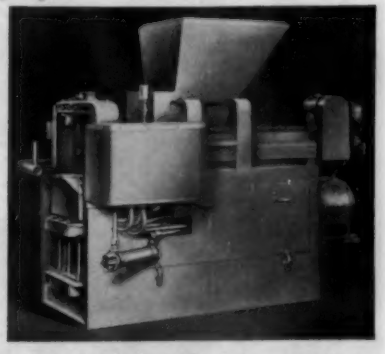

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lished two tentative specifications for low pressure pipe in 1955, one for pressures up to 100 ft., the other a sewer pipe specification for heads up to 50 ft. During the past year many A.S.T.M. tentative specifications have been incorporated into standard forms.

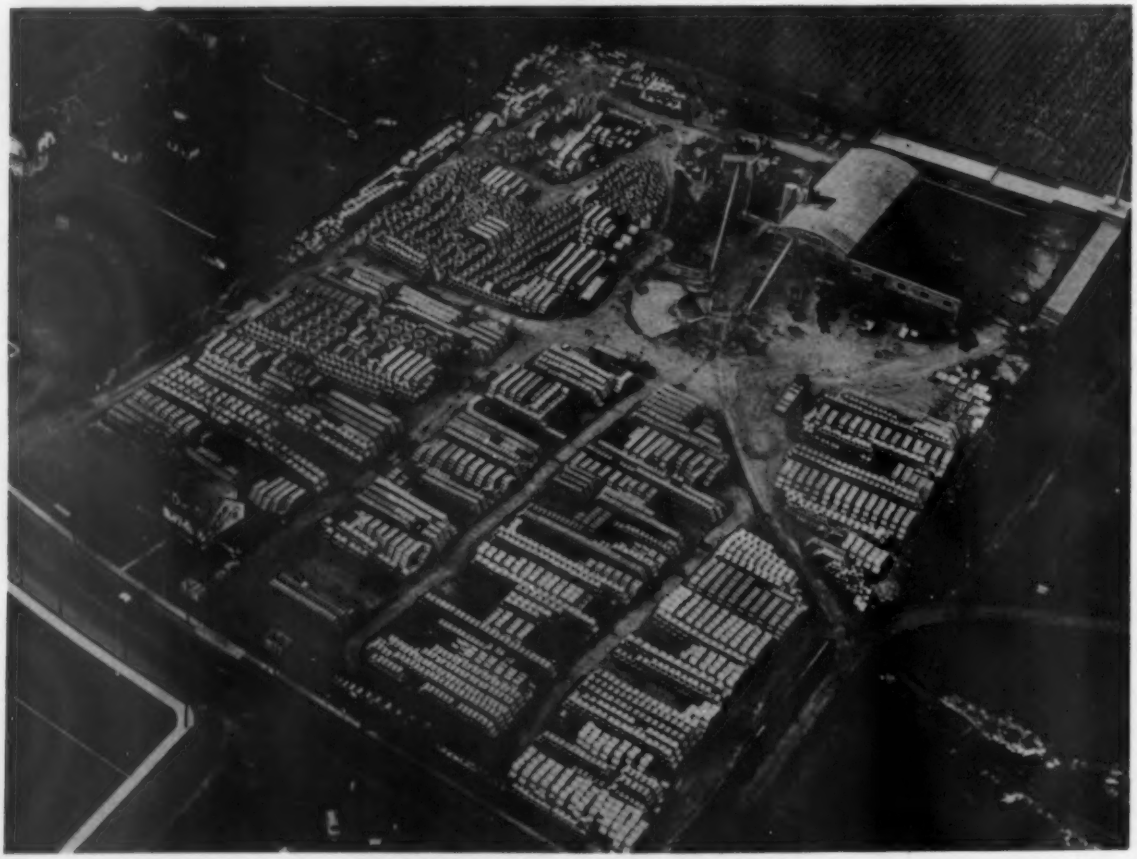
A.S.T.M. Committee C-13, on concrete pipe, met in Chicago in November. The chief business conducted at this meeting was a reorganization of the committee into several sub-committees to study each of the specifications under its jurisdiction. More than 35 suggested revisions and matters to clarify portions of the specifications were brought to the attention of Committee C-13 and referred to the various new sub-committees.

The U. S. Bureau of Public Roads has been progressing rapidly toward the completion of a specification for the installation of concrete pipe under high fills. There are many states where a 100-ft. fill is becoming common. In some of these cases, for certain poor bedding conditions or for other unusual construction practices, a pipe may be required that is able to withstand greater loads than are now in the design tables. The concrete pipe industry has appointed within its own framework a special committee of design engineers, to formulate new specifications for pipe to meet these conditions. Progress has been reported by this committee and a preliminary report is expected from it early in 1956. The last report covered the tests made in 1954 in which various arrangements of shear reinforcing at top and bottom more than doubled the strength of large diameter pipe.

Committee work continues to hold an important part in the concrete pipe industry affairs, leading invariably toward progress through discussion. Industry members support through membership and active participation such organizations as the A.S.T.M., the A.S.C.E., A.C.I., American Water Works Association, American Association of State Highway Officials, American Road Builders Association, Highway Research Board, and others. These organizations, allied in end purposes, afford an interchange of information which is highly valuable to the rank and file of the concrete pipe industry, under the newer systems of selling the discriminating buyer or engineer on concrete pipe and its advantages.

Other research which has continued through 1955, particularly in the dissemination of knowledge that concrete pipe has superior hydraulic characteristics, has included the continuing studies being made at Tulane University. Last year's work on the study of its resistance to acid and alkali action produced several significant conclusions. It is expected that such work will continue for several years, to include other phases of study which may be indicated as necessary in view of the more recent changes in specifications on concrete pipe. The details of these and other current research projects and their meaning in terms of dollars of possible profit to the pipe manufacturer have been regularly publicized in the industry in *Concrete Pipe News*, the monthly house organ of the American Concrete Pipe Association.

During 1955 several member companies of the A.C.P.A. celebrated their golden anniversary of 50 years of production of concrete pipe. Among those companies which have completed or are completing this



The variety of pipe sizes stocked by the Gray Concrete Pipe Co., Hagerstown, Md., shows the growing use of pipe today.

epochal year of business are the Sibley Cement Company, Sibley, Iowa; the Wilson Concrete Company, Red Oak, Iowa; and the Lock Joint Pipe Company, East Orange, N. J.

A. W. G. Clark, of the B. C. Concrete Company, Ltd., Vancouver, B. C., Canada, was elected for a second term as president of the A.C.P.A. at its annual meeting held in Boston, Mass., in March, 1955. The executive committee of the association held its annual meeting at the Homestead, Hot Springs, Va. The 48th annual convention of the association will be held at the Broadmoor Hotel, Colorado Springs, Colo., March 6 to 10, 1956.

The fifth annual short course School of Instruction of the A.C.P.A., held in St. Louis, Mo., in November, 1955, attracted another record attendance from member company personnel. Continued growth of this nature will mean that future schools will probably be held twice a year on each coast, to split the attendance and to retain the intimate atmosphere most conducive to the exchange of information. It has been found most beneficial as a matter of education, to describe the basic engineering principles of concrete pipe direct to the user in these schools, in lectures before engineering groups, etc. It is planned to augment the descriptive films and slides available for such meetings.

The membership of the A.C.P.A. grew during 1955 by the addition of eight new members, making the present total membership 198. Four new foreign and one new member from Canada were accepted in the last year. This association now represents from 80 to 90 percent of the total tonnage of concrete pipe produced in this country. As it has been recognized that the smaller, outlying pipe producers are most in need of the promotional aid which the A.C.P.A. affords, a larger proportion of its efforts in 1956 will be channelled into those fields.

The use of fly ash in concrete pipe, mentioned in last year's review, has continued in 1955. Where earlier the use of fly ash was at the discretion or choice of the producer, in 1955 more and more agencies specified either the use of fly ash or another suitable pozzolan in the manufacture of concrete pipe where sulfate or in some cases acid resistance was required, over and above that obtainable with normal portland cement mixes. One Midwest distributor of fly ash indicates that the use of the firm's material in concrete pipe rose 50 percent in 1955 over the prior year. It is expected that this trend will continue.

Little shortage of portland cement was experienced by pipe producers in 1955, according to the replies received from manufacturers. Several factors would have a bearing on this: Concrete pipe is so closely tied to road contracts that usually the producer of pipe enjoys a higher priority on cement to eliminate any delay in the major contract. The stable condition of the pipe industry and the large quantities of cement used usually include large storage capacities at the plants and standing orders for cement well in advance of its use.

Farm drainage requirements took the bulk of drainage pipe produced in 1955. This category included about 10 percent of the total tonnage of pipe produced in the country in that period. Plant consolidations were at the minimum relatively in 1955. In connection with this phase of progress it is well known that evaluation of the industry and its increment units by shrewd business men is constantly taking place, however, and any mergers of consequence should ultimately result in making the industry as a whole sounder and more capable of progress in the future.

Ready-Mixed Concrete

(*From page* 283)

negligible, although its use, such as it was, practically doubled from 1954 to 1955, averaging for the country 3.4 percent of the total aggregates. The greatest use and increase within the year was in the West, where plants reported that 10.5 percent of the aggregates used were lightweight.

Over 42 percent of the plants in the U. S. which responded to our questionnaire are using short wave radio communication in all or a part of their fleets. This use varied only slightly in different sections of the country. Two aspects of radio use in fleets was shown clearly—that if radio is used at all, it is generally installed in a high percentage of the truck units operated, and that an extended use of radio is contemplated for 1956. These conclusions were expected in view of the lessening of restrictions placed on radio use by the Federal Communications Commission recently, and because of the economies effected by such use, particularly in the larger urban centers. Nearly 65 percent of the companies which reported said that they employ some system of intraplant communication.

Prestressed Concrete—A New Horizon

Tremendous progress was made in 1955 by the many producers of prestressed concrete. During the year it has been almost impossible to keep abreast of the many variations offered by these producers who have applied the principles of prestressing to concrete construction, to make possible remarkable advances in structural engineering.

Many of those who have entered the prestressed field in the last few years have been basically producers of concrete blocks. They have utilized the special knowledge gained in recent years to combine the great compressive strength of heavy weight concrete units with suitable high-tensile steel strands capable of resisting stresses of over 200,000 p.s.i., to form beams capable of spanning the standard dimensions of most structures. In addition to having equipment which will produce suitable high-strength concrete units in prodigious quantities, these plants also have facilities for properly curing the units. It is comparatively simple to install equipment for grinding the contact surfaces of the blocks, and for prestressing the reinforcing by means of which high-compressive stresses are placed in the beam formed by this increment method.

The larger proportion of producers of prestressed concrete, however, make use of plastic and workable mixes of concrete—as against the combination of dry mixes used in block production—as the basic material. Such plants have had a mushroom-like growth in the last five years. An increase from the bare half-dozen plants which specialized in this technique in 1950 to the more than 200 such plants which exist today is proof of this fact. Both those who have adapted the block unit and those who mix concrete *per se*, have been guided by the same basic concept.

Concrete has a shortcoming in that its strength in tension is much smaller than in compression. This means that when a concrete beam is subjected to enough loads, the lower portion of the beam tends to crack. The necessary corollary to the high-compressive strength of concrete is the use of the high-tensile steel strands developed in recent years.

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Lith-I-Bar L-3 Block Machine Serial A-2095, complete with Air Compressor and Off-Bearer, also Moulds for four, eight, and twelve inch Blocks. All in good condition. Priced to sell.

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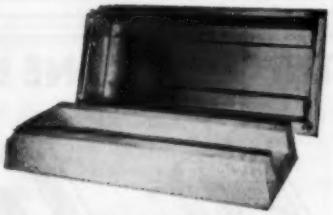

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Expand Your Opportunities — Cash in on the Split Block demand. Its "quarried stone" character pleases owners. You'll find it ideal for all structures, large or small . . . commercial, institutional or home construction. BES-STONE challenges the creative ability of both architects and builders.

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Indispensable tool for on the job. Trims off the end of any block up to 8" by hand operated, hydraulic pump. Capacity 12 tons. Legs easily removable. Compact. Lightweight. Easily portable.

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There's big money for you in attractive, permanently colorful BES-STONE Split Block. It complements and increases sales of standard stripper block. Get all the facts. Write for BES-STONE Bulletins 95A and 100.

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A 7908.½HR2

BAUMANN CINDER BLOCK CURING HEATER FIRED WITH OIL—LP OR NATURAL GAS

Makes a block equal to low pressure steam curing, and because the unit fires directly into the kiln, there is not the 25-35% heat loss up the chimney, as with a steam boiler.

The unit is equipped with a copper coil—that produces 214 degree F. water—which is distributed through a series of nozzles placed throughout the kiln.

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Made in various sizes to suit your requirements.

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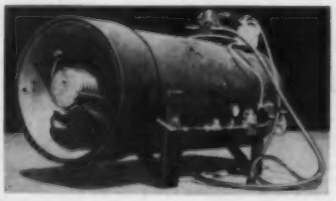
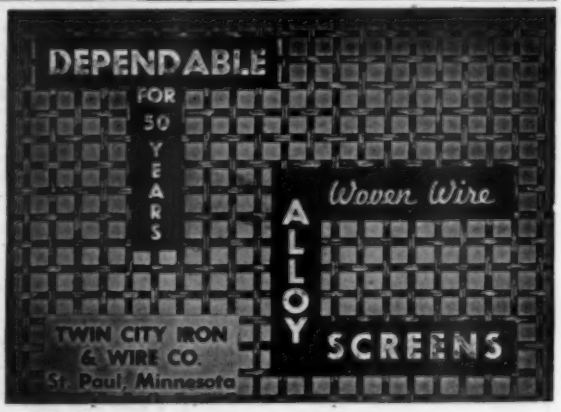


Arthur C. Baumann
7011-21 Grays Ave.
Philadelphia 42, Pa.



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Two 1½" air spaces provide sufficient insulation.

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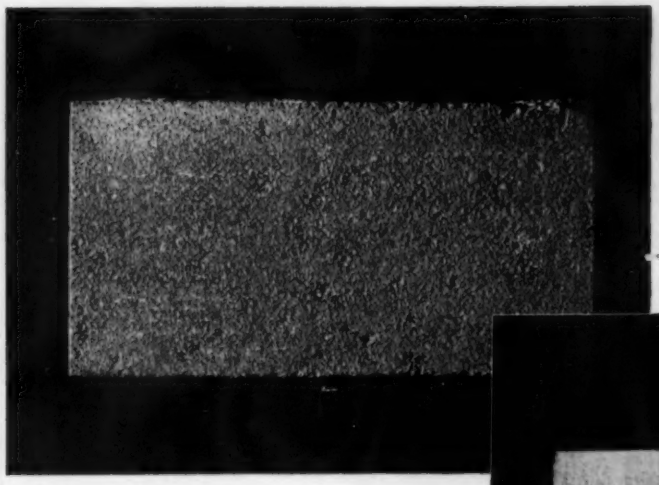

ORDINARY BLOCK Without NR PLASTIC—
ROUGH FINISH, DARK COLOR

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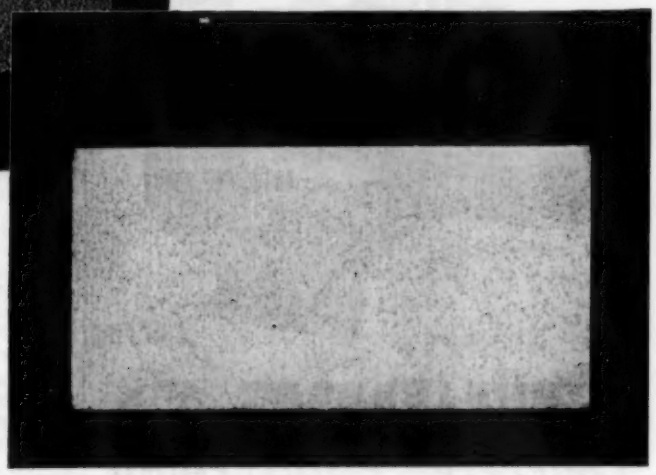
SMOOTH FINISH, LIGHTER COLOR

* Manufactured at HOEPNING'S CONCRETE PROD. CO., Menasha, Wisconsin.



With
JUST *ONE* TABLESPOON OF
DRY, POWDERED
NR PLASTIC
PER BAG OF CEMENT!

GREATER PLASTICITY IN THE GREEN UNIT — PLUS 20% LIGHTER COLOR...
Cost... ½c per Bag of Cement!

Hydrate ALL the cement in your dry block and pipe mix . . . with just *one* tablespoonful of dry, powdered NR PLASTIC per bag of cement. Cost.....½c per bag!

YOU'LL GET . . . . . .

A 20% lighter colored unit with a more thoroughly wetted cement paste! Complete hydration through complete saturation without adding more water! Sharper corners . . . better texture . . . smoother, denser surfaces through greater compaction! Faster, cleaner feeding into . . . and stripping from . . . the mold box! 50% reduction in wear on mold box liners! Greater plasticity in the green unit through absolute dispersion of water and cement . . . and . . . complete coating of all the aggregate particles! Simple and economical to use . . . add dry as it comes from the container! Cost ½c per bag of cement!

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CONCRETE MANUFACTURER INDEX TO ADVERTISERS

A A Wire Products Co. 258
Adams Division, LeTourneau-Westinghouse Co. 255
American Clay Machinery Div. Huber-Warco Co. 277
Baumann, Arthur C. 318
*Bergen Machine & Tool Co., Inc. 269
*Besser Manufacturing Co. 250, 303, 313, 318
*Bin-Dicator Co. 260
*Blaw-Knox Co. 253
C & W Sales Co. 265
Carpenter Mfg. Co. 313
Carter-Waters Corp. 304
Chase Foundry & Mfg. Co. 294
Classified Section 316-317
Columbia Machine Works 261
Columbia Southern Chemical Corp. 247
Concrete Post Form Co. 313
*Construction Machinery Co. 295
Cook Bros. Equipment Co. 299
Darden Industries, Inc., Roy 308
Des Moines Glove & Mfg. Co. 308
Dunn Mfg. Co., W. E. 313
Dur-O-wal 310
Economy Forms Corp. 267
Edick Laboratories 319
Elastizell Corp. of America 252
Erickson Power Lift Trucks, Inc. 279
Forney's, Inc. 264
General Engines Co., Inc. 317
Gwynne, Inc., J. H. 320
*Hoffmann Co., Geo. W. 317
Huber-Warco Co. 277
Jaeger Machine Co. 272-273
Jones Concrete Machinery Co. 256
Kent Machine Co. 262
Kirk & Blum Mfg. Co. 260
Lith-I-Bar Co. 267
Lone Star Cement Corp. 246
Mace Company 310
Marsh Engineering Co., E. F. 254
*Material Handling, Inc. 307
Medusa Portland Cement Co. 322
Monarch Road Machinery Co. 301
Moore Dry Kiln Co. 294
National Wire Cloth Co. 321
Noble Company 248
Norwalk Vault Co. 308
Olsen Corp., Gene 275
Oswalt Engrg. Service Corp. 295
PreCaster, Inc. 265
Quinn Wire & Iron Works 258
Radio Corporation of America 259
Reichard-Coulston, Inc. 321
St. Lawrence Cement Co. 301
Schield Bantam Co. 300
*Scientific Concrete Service Corp. 309
Shawnee Step Form Co. 308
Side-O-Matic Unloader Corp. 323
*Smith Co., T. L. 284-285
Spillman Co., R. L. 317
Standard Dry Kiln Co. 301
*Stearns Manufacturing Co. 324
Stoody Co. 280
Superior Pneumatic & Manufacturing, Inc. 320
Surety Rubber Co. 321
Thermo Stone Brick Co. 318
Trinity Div. General Portland Cement Co. 294
*Twin City Iron & Wire Co. 318
Twin Tilt Truck Co. 256
Ty-Sa-Man Machine Co. 306
Unit Step Form Co. 290-291
Williams, Roger F. 310

*See also Detailed Information in 1955 Pit and Quarry HANDBOOK and CONCRETE INDUSTRIES YEARBOOK.

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CUT GLOVE COSTS

TRIPL-PALM design eliminates the "failure points" of ordinary work gloves, resulting in multiplied glove life . . . greatly reduced glove costs.

Knit-wrist or gauntlet style with coated or "free-breathing" backs. Ask your jobber or write for information.

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EXTRA-HEAVY COATING FOR EXTRA LONG WEAR . . . and greater palm comfort.

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In Canada: Safety Supply Co., Toronto

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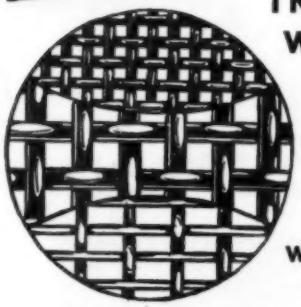

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WE OFFER NOW . . .

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OIL TEMPERED WOVEN WIRE CLOTH

★ GREATER RESISTANCE TO ABRASION.

★ MORE TONNAGE AT LOWER COST.

★ FEWER COSTLY CHANGE OVERS.

AVAILABLE IN FLAT SURFACE, LOCK CRIMP, DOUBLE CRIMP AND RECTANGULAR OPENINGS.
ALSO LONG SLOT SCREENS.
PROMPT SHIPMENT — WRITE OR PHONE

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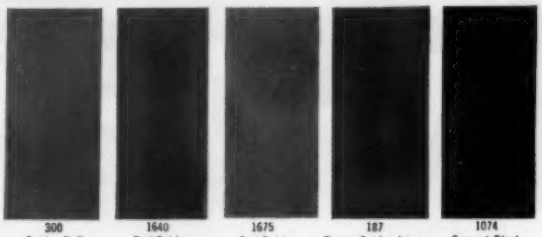

A guide for choosing concrete colors

For producers of split blocks, patio blocks, concrete blocks and other colored concrete products.

Manufacturers of colored concrete products agree . . . *The pigments they use must have these 3 important qualities:*

1. A high degree of tinting strength when added to the mix
2. Color uniformity year in, year out
3. The ability to incorporate easily

Manufacturers also require a pigments supplier whose technical department is capable and cooperative, whose shipping service is prompt and dependable.

Point for point, REICHARD-COULSTON quality-controlled pigments and dependable service meet *all* these requirements!

The shades shown above are just 5 of the many concrete colors manufactured by REICHARD-COULSTON. Included are yellows, buffs, maroons, grays, reds.

For a free color card, fill in and mail the coupon. Act now.

GENERAL RECOMMENDATIONS: PASTELS (*Split blocks and similar products*), 2-4 lbs. for each bag of cement. DEEP SHADES (*Patio blocks, concrete blocks, etc.*), 6-8 lbs. for each bag of cement.

Reichard-Coulston, Inc.

15 EAST 26th STREET, NEW YORK 10, N. Y.

Warehouses in principal cities; factory: Bethlehem, Pa.
Over a century of manufacturing and service

Natural IRON OXIDE PIGMENTS *Synthetic*

REICHARD-COULSTON, Inc.
15 East 26th St., N. Y. C. 10

CM-16

Gentlemen: Please send me a free card of REICHARD-COULSTON concrete colors.

My name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

...FOR CONCRETE PRODUCTS!

You can perform white magic in your concrete product! Use Medusa "the original" White Portland Cement for cast stone, concrete blocks, concrete brick and tile, curbing, ornamental concrete, fence and marking posts and many other products, and notice the amazing results. You'll be amazed at their white or colored beauty . . . a new clean look that sets your products apart from any competitors. That's because in all the world there is no whiteness like the diamond blue white of Medusa White. Concrete products manufacturers in every state have built successful business by taking full advantage of the magic of Medusa White . . . And for products whose beauty lasts indefinitely they use Medusa White *Waterproofed*. It sheds water and dirt . . . keeps concrete products free from dirt soiling for years to come.

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WHITE TILE GROUT CEMENT

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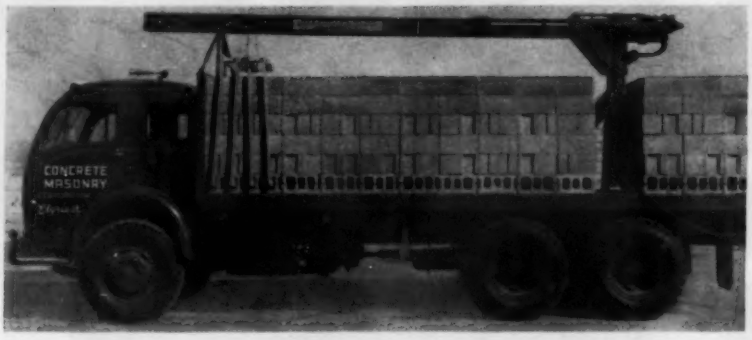
UNLOADS ON BOTH SIDES AND REAR



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Memo for JANUARY '56 . . . to

CONCRETE BLOCK PRODUCERS

from **SIDE-O-MATIC**
UNLOADER CORPORATION

You are invited to see

AT THE N.C.M.A. CONVENTION

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"The Side-O-Matic Story"

A continuous self-contained movie in color showing the ultimate in block delivery.

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Fred W. Cramer
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Stearns new Electro-matic block machine combines Stearns pioneer engineering with a unique, revolutionary . . . yet time proven principle for block machine operation. Get the full particulars from any Stearns representative or contact Stearns at the NCMA Convention.

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MANUFACTURING COMPANY • INC.
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40 TO 400 MESH OUTPUT UPPED AS MUCH AS 300%

ENGINEERING AIR SEPARATORS TO SPECIFICATION

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The "OPEN-DOOR" to *lower* operating costs over *more* years

CRUSHERS • GRINDERS • MICRON-GRINDERS • SEPARATORS
BLENDERS • GRANULATORS • CONVEYORS • ELEVATORS

My dry-process materials are:_____

Desired capacity is:_____

Name_____ Title_____

Firm_____

Street_____

City_____ Zone_____ State_____

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Please send me your bulletin on Air Separators ☐
Also bulletins on machines for:

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☐ MICRON-GRINDING ☐ SEPARATING ☐ BLENDING
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DEMPSTER DIGGSTER® GRD-101

....only front end loader or small shovel of its type with bottom dumping bucket!

HERE IS A SMALL SHOVEL and front end loader that is fully operated by hydraulic power with independent crowd and hoist action—an excavator and loader that needs no wheel traction. It is the only shovel of its type featuring bottom dumping bucket—emptied completely and instantly!

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Above Dempster-Diggster GRD-101 is equipped with 1½ cu. yd. loading bucket for materials-handling. Photo below shows Dempster-Diggster GRD-101 excavating with 1 cu. yd. bucket with four teeth.

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This Allis-Chalmers Crawler Tractor
MAKES A TIDY PROFIT
THEN LEAVES A TIDY LANDSCAPE

The marked trend toward land reclamation is placing more and more importance on the crawler tractor. For only the crawler tractor is flexible enough to pay its way through all stages of open pit operation.

Here, the Allis-Chalmers HD-16 proves to be a real efficiency expert as it demonstrates its usefulness both during *and after* an area has been worked.

Before production begins, the HD-16 strips and stockpiles overburden. If distance from pit to stockpile is too great for dozer operation, this versatile crawler teams up with a pull-type scraper for this initial job.

After the area has been worked out, the reclamation job begins. Overburden and waste, which have been stockpiled by the busy dozer, are now pushed into the pit and leveled off quickly. Reclaimed area can then be seeded for pasture, subdivided, or developed into some other form of usable land.

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CONSTRUCTION MACHINERY DIVISION,
MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS HD-16

your choice of two outstanding drives

	Horsepower	Weight
Torque Converter Drive	150 net engine	31,600 lb
Standard Transmission Drive	131 belt	31,500 lb

plus new, longer truck frames, long-life track, straddle-mounted final drive, easier servicing . . . many other outstanding features.

Write for literature or get the full story from your Allis-Chalmers dealer.

ALLIS-CHALMERS

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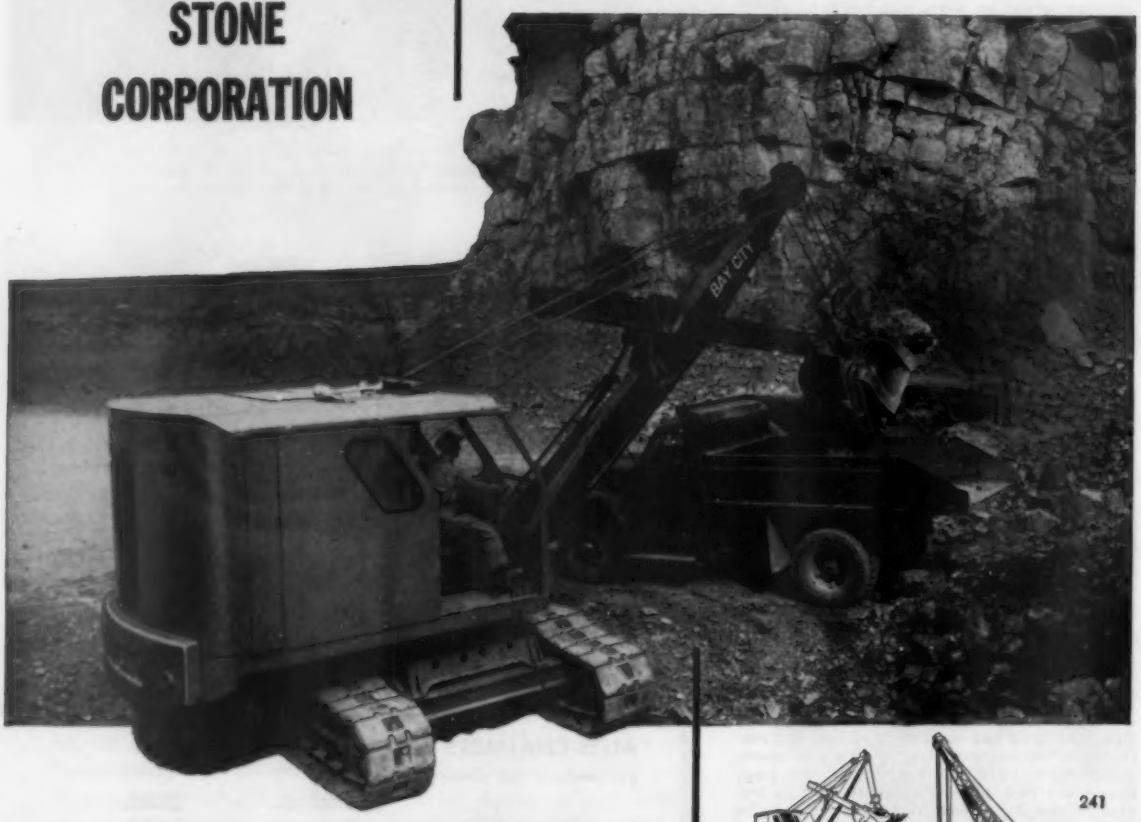
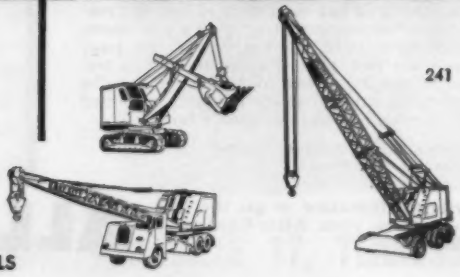
¾-YARD SHOVEL handling 800-1000 tons blasted rock per day for the CATSKILL MOUNTAIN STONE CORPORATION

"Our BAY CITY Model 45 shovel with ¾-yard rock type dipper not only averages 800 to 1000 tons of blasted rock per 10-hour day in feeding the crusher, but it also sorts out stones weighing up to 6 tons for secondary blasting," says Mr. W. H. Peckham, President of Catskill Mountain Stone Corporation. BAY CITY doubled the daily production over a former light duty ¾-yard shovel, proving once again that for heavy duty work there's nothing like the tough, powerful BAY CITY. It has double dipper sticks, 3-part line, a 6-foot rotating path, helical cut gears, separate shafts and bearings for each hoist drum, and it is powered by a big 517 cubic inch Waukesha engine. These specifications compare favorably with many 1-yard shovels. Get complete information on the BAY CITY 45 from your BAY CITY dealer.

Write for these catalogs describing BAY CITY *Crawlers of ½ yards and up,* BAY CITY *CraneMobiles and CraneWagons in capacities to 25 tons.*





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BAY CITY

BAY CITY SHOVELS, INC. • BAY CITY, MICHIGAN

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

Wire Rope at Work — Here's an installation that any mine owner could show with pride. It is the "A" shaft headframe at Peterson Mine, in Michigan's Gogebic Range. The Peterson property, which yields large tonnages of iron ore, is operated by Puritan Mining Company, Ironwood.

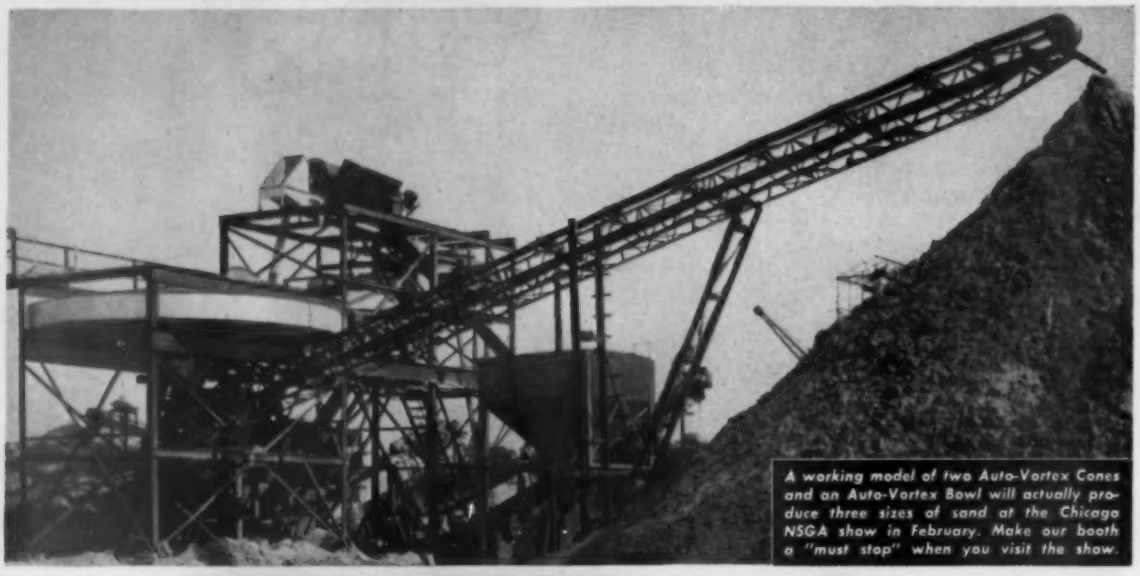
The largest, sturdiest shaft ropes ever used in the region give added distinction to this trim installation. The balanced skips and the balanced cages require four separate ropes, the pair for the skips being 2¼-in. diameter, those for the cages 1¾-in. All of these husky wire ropes are of Bethlehem manufacture—Purple Strand grade, of course. Purple Strand is Bethlehem's best, and here, as in mines and quarries all over the country, this tough wire rope is more than equal to the jobs assigned it.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

MINING • QUARRYING • CONSTRUCTION • PETROLEUM • EXCAVATING • LOGGING • MANUFACTURING

Heres another Low-Cost Auto-Vortex Installation making a variety of sharp splits at Lower operating costs!



A working model of two Auto-Vortex Cones and an Auto-Vortex Bowl will actually produce three sizes of sand at the Chicago NSGA show in February. Make our booth a "must stop" when you visit the show.

The Cones with their revolving cylinders automatically discharge the coarser materials. Powered solely by the gravity flow of the water, no costly electrical power whatever is needed. The accurately controlled uprising speed of water flow determines the size of sand settled.

The Bowl with its slowly revolving rakes settles the fines which are automatically discharged directly onto an inclined conveyor. Its sole power requirement is a three HP motor.

Classifiers and Structure Built by Charles E. Wood Co.

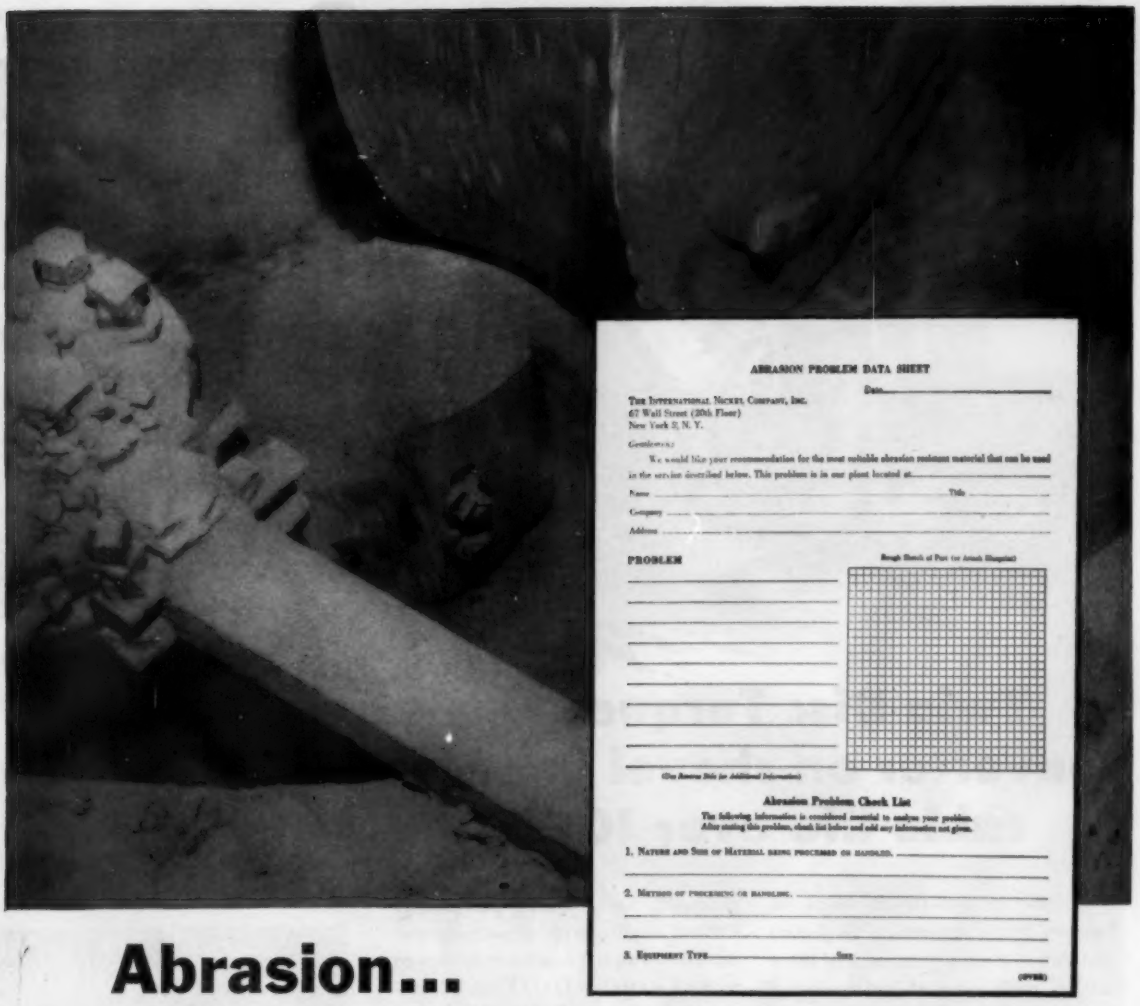
TEXAS PRODUCER DISCOVERS EFFICIENCY of FLEXIBLE AUTO-VORTEX CLASSIFIERS

Like many other Auto-Vortex plants making sharp splits under widely varying conditions, this Texas plant is delivering special requirement products to a sharpness beyond the expectations of the owner. The greater operating economy of the Auto-Vortex System over other classifying equipment is making possible competitive pricing with a substantially larger profit margin.

Your own requirements may be met with a single cone, a single bowl, or some combination of the two. But, alone or in series, Auto-Vortex Classifiers are delivering sharper separations than any other type of classifier.

Call or write for our Bulletin No. 81 on Auto-Vortex Cone and Bowl Classifiers.

CHARLES E. WOOD COMPANY
906 NORTH WATER ST. • MILWAUKEE 2, WISCONSIN



ABRASION PROBLEM DATA SHEET

Date_____

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street (20th Floor)
New York 5, N. Y.

Gentlemen:

We would like your recommendation for the most suitable abrasion resistant material that can be used in the service described below. This problem is in our plant located at_____

Name_____ Title_____

Company_____

Address_____

PROBLEM

(Rough Sketch of Part (or Attach Blueprint))

(Use Reverse Side for Additional Information)

Abrasion Problem Check List

The following information is considered essential to analyze your problem. After stating this problem, check list below and add any information not given.

1. NATURE AND SIZE OF MATERIAL BEING PROCESSED OR HANDLED._____

2. METHOD OF PROCESSING OR HANDLING._____

3. EQUIPMENT TYPE_____ SIZE_____

(OVER)

Abrasion... and a suggestion for its control

SCORES OF PLANT OPERATORS have cut abrasive wear to a degree sometimes thought unattainable, but finally demonstrated by their own equipment.

INCO experience in solving abrasion problems made this possible. Without any sort of obligation the same practical experience is available to you if your plant is now absorbing the daily cost for excessive wear. Here are the steps to take:

Step 1

Send for the Abrasion Problem Data Sheet.

Step 2

Outline your problem as completely as possible. Make sure no significant factors will be overlooked.

Step 3

Return the completed form. This will enable you to receive information most applicable to your particular requirement. *Take the first step now. Fill in and return this coupon.*

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

Please send me the Abrasive Problem Data Sheet so that I may outline my problem to you.

Name_____ Title_____

Company_____

Address_____

City_____ State_____

INCO TRADE MARK

THE INTERNATIONAL NICKEL COMPANY, INC. 67 Wall Street New York 5, N. Y.

Twin Disc Torque Converter on shovel increases cable life over 100%!

Records of Zontelli Brothers, of Ironton, Minn., owners of the JoAnn Iron Mine, show replacement of *seven sets* of cable on a shovel equipped with straight mechanical drive—while replacing only *three* sets on one driving through a Twin Disc Torque Converter . . . a substantial reduction in down time, *plus* increased cable life of *over 100%*.

According to Al Fox, Master Mechanic, "considering the cost of down time in replacing cables—plus the cost of cable itself and the actual labor involved in replacing them, the Twin Disc Torque Converter saves us a lot of money."

Both these Model 54-B Bucyrus-Erie 2½-yd. shovels are used to load trucks with iron ore from the open pit mine, where it is then hauled to the washing and crushing plant and processed. One shovel is powered by a diesel engine, with direct mechanical drive—and the other is equipped with a Caterpillar D337 Diesel, working through a Twin Disc Model CF Torque Converter.

In over-all comparisons, the torque converter-equipped shovel increases production, consumes less fuel, and substantially reduces maintenance costs wherever it is used.

For *automatic* matching to load demands, with torque multiplication up to *six times* . . . for cushioning *out* overloads, shock loads and vibrations . . . *specify* Twin Disc Torque Converters for *your* shovels. *Increase* production and cable life — *reduce* fuel and maintenance costs. *Get all the facts.* Write *today* to Twin Disc Clutch Company, Hydraulic Division, Rockford, Illinois. Request Torque Converter Bulletin 135-D.

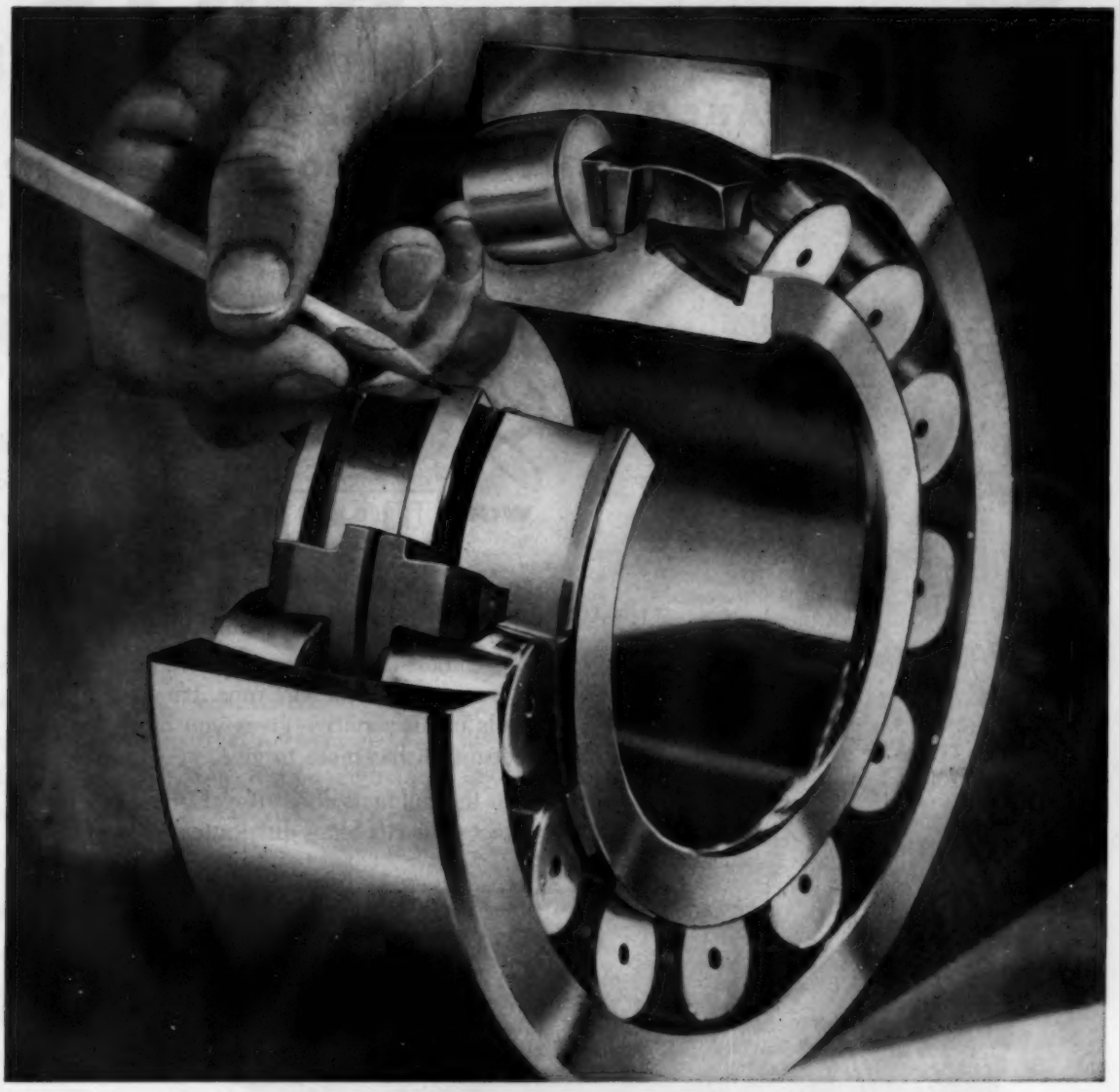
This Model 54-B Bucyrus-Erie 2½-yd. shovel—powered by Caterpillar D337 Diesel Engine, driving through a Twin Disc Model CF Torque Converter—is loading ore from the JoAnn Iron Mine, owned by Zontelli Brothers, Ironton, Minn.

TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES

TWIN DISC
Torque Converters

BRANCHES OR SALES ENGINEERING OFFICES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • TULSA

TORRINGTON *SPHERICAL ROLLER* BEARINGS



"This flange guides the rollers to peak performance!"

The center flange on the inner raceway of the TORRINGTON Spherical Roller Bearing positions the rollers to handle thrust loads. This accurate positioning also assures radial stability of the rollers under heavy loads—even at continuous high speeds and under conditions of misalignment.

This superior design feature is only one of many advantages you get when you specify TORRINGTON. For example, you get the service of TORRINGTON'S experienced engineers, who will help you with design and maintenance problems—or design custom bearings for special applications.

For long, low-maintenance service in heavy-duty applications, order TORRINGTON Spherical Roller Bearings. They're available from stock with either straight or tapered bore, for shaft or adapter mounting.

THE TORRINGTON COMPANY
South Bend 21, Ind. • Torrington, Conn.
District offices and distributors in principal cities of United States and Canada

90th ANNIVERSARY 1866-1956

TORRINGTON BEARINGS

Spherical Roller • Tapered Roller • Cylindrical Roller Needle • Ball • Needle Rollers

THE STRONGEST WIRE MAKES THE STRONGEST ROPE... THAT'S WHY ONLY 1105 IS USED IN

ROEBLING

Royal Blue

WIRE 1105 ROPE

1105 WIRE is the strongest and toughest rope wire that has ever been developed.

Royal Blue is a new all-steel wire rope. It's made of 1105 wire—stands up in service—gives you more for your money because it has more to give.

Ask us for the full facts about Royal Blue Wire Rope, or contact your Roebling distributor.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13235 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 3340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST. AVE. S. • TULSA, 321 N. CHEYENNE ST.• EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6, N. Y.

LIMA

SHOVELS - DRAGLINES AND CLAMSHELLS

are geared to quarry and pit conditions

Down time in digging operations is costly—not only because of difficult on-the-job maintenance—but because down time of machines ties up costly labor and idles other expensive equipment. Lima shovels and draglines, with "built-in" stamina for the tough jobs, pay big dividends by assuring continuous operation with maximum output at lowest cost.

Painstaking care in every step of manufacture assures the quality of every part, long trouble-free service of every Lima machine. You'll be able to put a Lima to work and keep it working day in and day out with only routine maintenance.

Get complete details from your nearby LIMA distributor . . . or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

COMPARE QUALITY! No other machine gives you as much as **LIMA!**

1. Piston-ring-type dirt seal rings and retainers.
2. Moving parts are flame or induction hardened for longer life.
3. Main machinery is placed well back of center of rotation.
4. Anti-friction bearings at all important bearing points.
5. Big capacity drums and sheaves are easy on cables.
6. Propel and swing gears and power take-off are enclosed in a sealed oil bath.
7. Torque converter (optional on certain types).
8. Wherever you are, you can depend on skilled service and nearby warehouse stocks of parts.

These are only a few of the features which help you *strip more, dig more* and *load more* with a LIMA. There's a type and size for every job—shovels to 6 yds., cranes to 110 tons and draglines variable. Smaller capacities on rubber.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA SHOVELS · CRANES · DRAGLINES · PULLSHOVELS

BALDWIN-LIMA-HAMILTON

Construction Equipment Division · LIMA · OHIO · U. S. A.

Cut Grinding Costs!

ABK METAL LINERS GIVE BIG SAVINGS

Substantial savings are realized by cement mill operators using ABK Metal liners in primary, secondary or tertiary compartments for wet or dry grinding of raw stone or finished product.

Extended liner life of as high as 3 or 4 times can be expected when ABK Metal replaces ordinary iron liners. That's because of the extreme hardness (500 to 700 Brinell, as required) and very high resistance to abrasion that is characteristic of every ABK Metal casting. A nickel-chrome iron of controlled structure, ABK Metal is produced only by Brake Shoe.

Why let abrasion steal your operating dollars. Specify ABK Metal castings . . . cut your replacement, maintenance and downtime costs and increase your grinding mills' efficiency.

QUALITY CASTINGS IN | **ABK METAL**
ABSCO METAL

1607

AMERICAN **Brake Shoe** COMPANY

Baltimore • Chicago • Houston • St. Louis • San Francisco • Superior • Toledo

BRAKE SHOE AND CASTINGS DIVISION
230 Park Avenue, New York 17, N. Y.

MORE THAN 300 LEADING MANUFACTURERS

are already putting

SKF TYPE "C" BEARINGS

in their products

Here are the trade marks of a few of more than 300 leading manufacturers – companies who want extra bearing performance – who already are using the *improved* SKF Type "C" Spherical Roller Bearing announced less than a year ago.

There are two reasons why

First: They know that for over 40 years, SKF has been *first* with anti-friction developments that *work*.

Second: They obtain, size for size, up to 50% more capacity, 2 to 3½ times increased life with SKF's Type "C" Spherical than they can obtain with any other available design, and at no increase in cost.

7330

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA
– manufacturers of **SKF** *and* HESS-BRIGHT® *bearings.*

©1954 – SKF Industries, Inc.

SKF®
BALL AND ROLLER BEARINGS

SHEFFIELD

ARMCO

MOLY-COP

TRADE MARK

COPPER-MOLYBDENUM-ALLOY

Grinding Balls

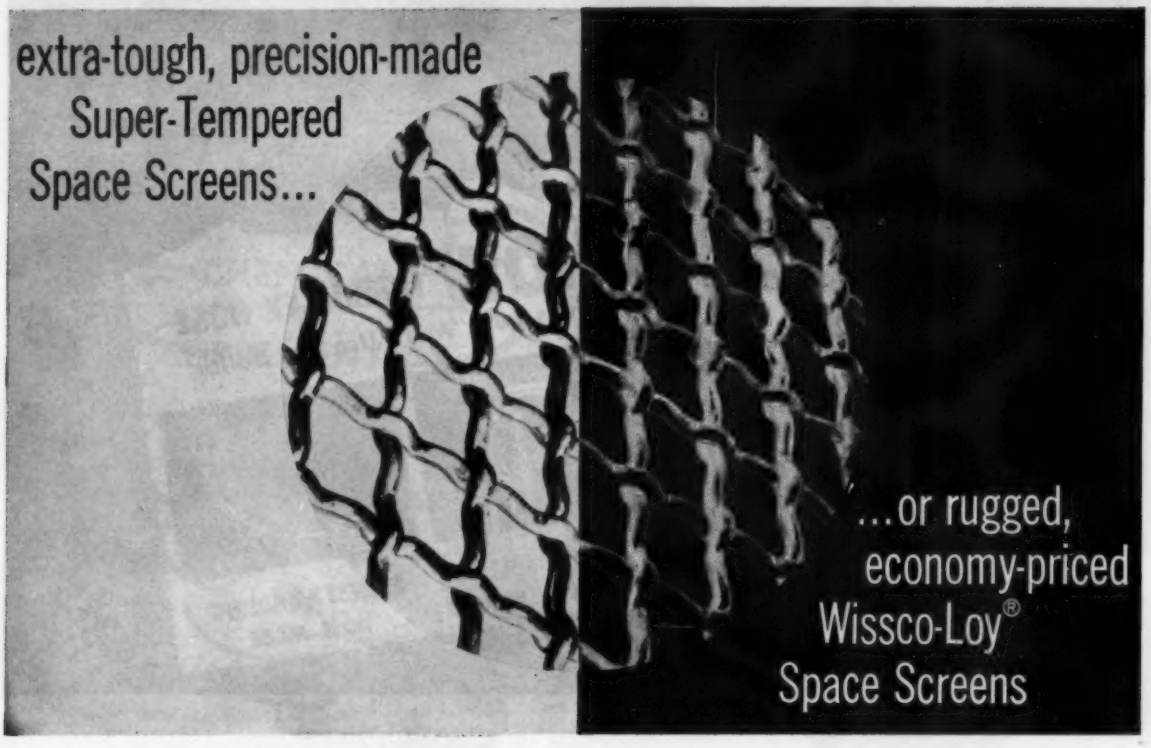
STANDARD of COMPARISON

for Over 20 Years!

SHEFFIELD STEEL
DIVISION
ARMCO STEEL CORPORATION
SHEFFIELD PLANTS: HOUSTON • KANSAS CITY • TULSA

Export Representatives: **ARMCO INTERNATIONAL CORPORATION** Middletown, Ohio

which best suits your needs?



Different sizing jobs require screens with different characteristics. That's why your CF&I representative carries both Super-Tempered and Wissco-Loy Space Screens—so he can offer you the one that will give you the most for your equipment dollar. For he knows that:

Super-Tempered Space Screens are made from oil tempered wire that is crimped to precision standards and woven extra tightly to maintain accurate, uniform spacing *resulting in the lowest cost-per-ton screening under the severest operating conditions.*

Wissco-Loy Space Screens are made of a special alloy steel wire that's carefully crimped at every wire intersection to assure accurate, tough and durable screens which hold cost-per-ton screening to a minimum.

There's a very simple way to find out which of these attractively-priced space screens is best for your own job. Just contact your nearby CF&I representative; he'll be happy to give you the complete story on both extra-tough, precision-made Super-Tempered and rugged, economy-priced Wissco-Loy Space Screens.

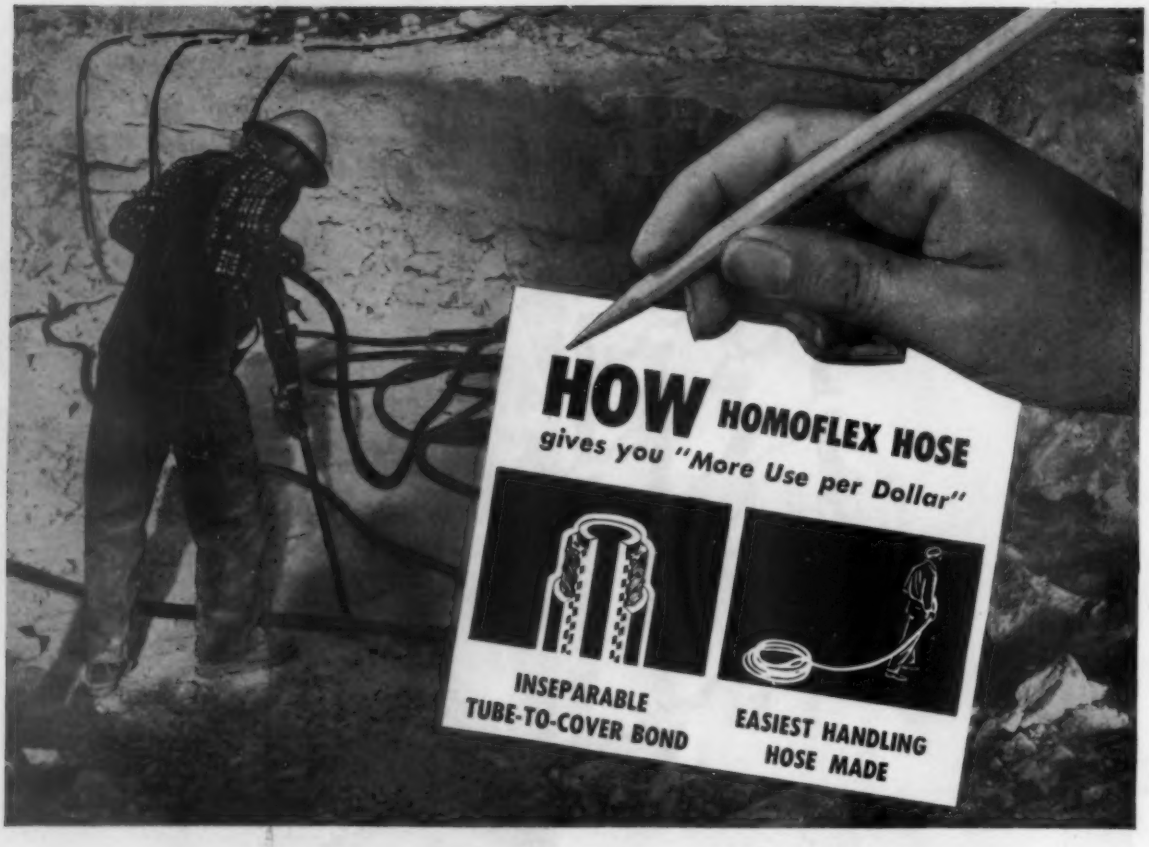
CF&I

WICKWIRE SPENCER STEEL DIVISION

The Colorado Fuel and Iron Corporation

THE COLORADO FUEL AND IRON CORPORATION—Denver and Oakland
WICKWIRE SPENCER STEEL DIVISION — Atlanta • Boston • Buffalo • Chicago
Detroit • New Orleans • New York • Philadelphia

3559



This Easiest Handling Hose Gets More Work Done–Cuts Labor Costs

Bulk and stiffness have been engineered *out* of this modern hose. The unique construction of Homoflex Hose makes it light, flexible as a rope, yet strong. Made with no pre-set twist, it coils and uncoils *without* kinking. Exclusive R/M engineering creates a homogeneous cover, strength member and tube that are virtually inseparable . . . This hose is easier to handle, yet strong and safe for the toughest jobs!

Homoflex Hose is easier to couple, too, because it has uniform inside and outside diameters. All these features mean that Homoflex Hose lasts longer, gets more work done, handling air, water, other fluids and gases. Ask the R/M representative to show you how Homoflex Hose and other types of R/M hose for general and special purpose use do a better job, longer . . . give you "More Use per Dollar."

RM-612

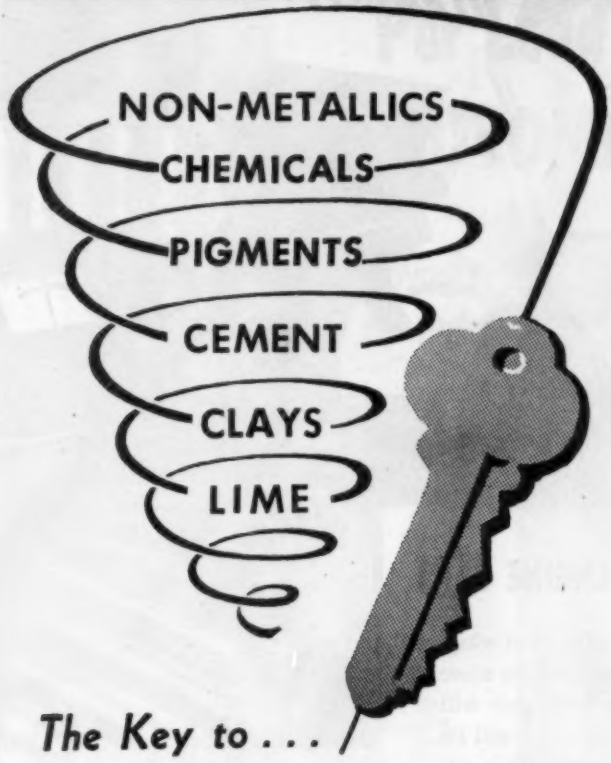
RM

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings • Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Laundry Pads and Covers • Bowling Balls

RAYMOND *Whizzer* SEPARATION



The Key to . . .

Premium Products

RAYMOND Mechanical Air Separators . . . with built-in revolving Whizzer . . . give close control of the finished finenesses over a wide range, from 50-mesh to 99.9% passing 325-mesh.

They are specially adapted for classifying raw mix or cement clinker as they can produce early strength or standard grades by the outside adjustment of the vertical slide dampers. They are equally efficient in making uniform grades of agstone, limestone sand, gypsum and various fillers.

Super Separator units are available for classifying sub-sieve materials in the lower micron sizes. Also for dedusting operations, as in the removal of fine dust from sea coal, soda ash and similar products.

Whizzer separation insures cleaner, faster and more uniform classification with greatly increased output. If you have a special problem, Raymond engineers can help you in setting up economical production methods.

Built in sizes from 4'0" to 16'0" diameter with Single Whizzer, or Double Whizzer (as shown). Also a 30" Air Separator, and a Laboratory 10" Separator.

For further details, see Bulletin No. 76.

COMBUSTION ENGINEERING, INC.

Raymond Division

1321 North Branch St.
Chicago 22, Illinois

Combustion Engineering-Superheater, Ltd. • Montreal, Canada

SALES OFFICES IN PRINCIPAL CITIES

Can you tell which Gear will deliver Trouble-Free Service?

MAYBE YOU CAN'T . . . BUT YOUR ENGINE CAN!

Two replacement crankshaft gears may *look* alike—but when one of them is a genuine Buda replacement part and the other a "will-fit"—there's a powerful difference! The Buda gear will be the *exact* part your particular engine requires . . . it will be made to carefully controlled tolerances and of material specifically developed to meet our standards. Once it's installed you'll know the difference, because your engine will operate at maximum efficiency and *continue* to deliver profitable horsepower hours for years to come.

Any replacement part—whether it's a gear, filter, a piston, set of rings, or a gasket—will give you the performance and service life you expect if it's a genuine Buda part. Be sure the parts installed in your Buda engines are genuine Buda parts . . . it pays in the long run.

Close-up photo of a "will-fit" crankshaft gear after 2000 hours of operation. Tooth surfaces and shoulders worn so badly that replacement was necessary.

This Buda crankshaft gear, taken from an engine after 3000 hours of operation, shows no appreciable wear, and could be re-installed in the engine.

See your nearby Buda Division Engine Distributor for any Buda replacement part you need. His stocks are complete and ready for immediate delivery.

BUDA DIVISION • HARVEY, ILLINOIS

A-C ALLIS-CHALMERS

ALLIS-CHALMERS

BC-35

Mr. Wm. Pfeiffer
Crystal Lake Trucking and
Excavating Co.

"Averages More Than 2 Yds. Per Load with 1¾ Yd. PAGE AUTOMATIC BUCKET"

loads 15 ton trucks in 95 to 105 seconds

Mr. Wm. Pfeiffer of the Crystal Lake Trucking and Excavating Company knows that in his business "Lost Time Means Lost Dollars."

That's why his machine is equipped with a Page RM Class Automatic Dragline Bucket . . . the bucket that will dig faster, dump cleaner and produce more yardage per rated capacity than the ordinary old style dragline bucket.

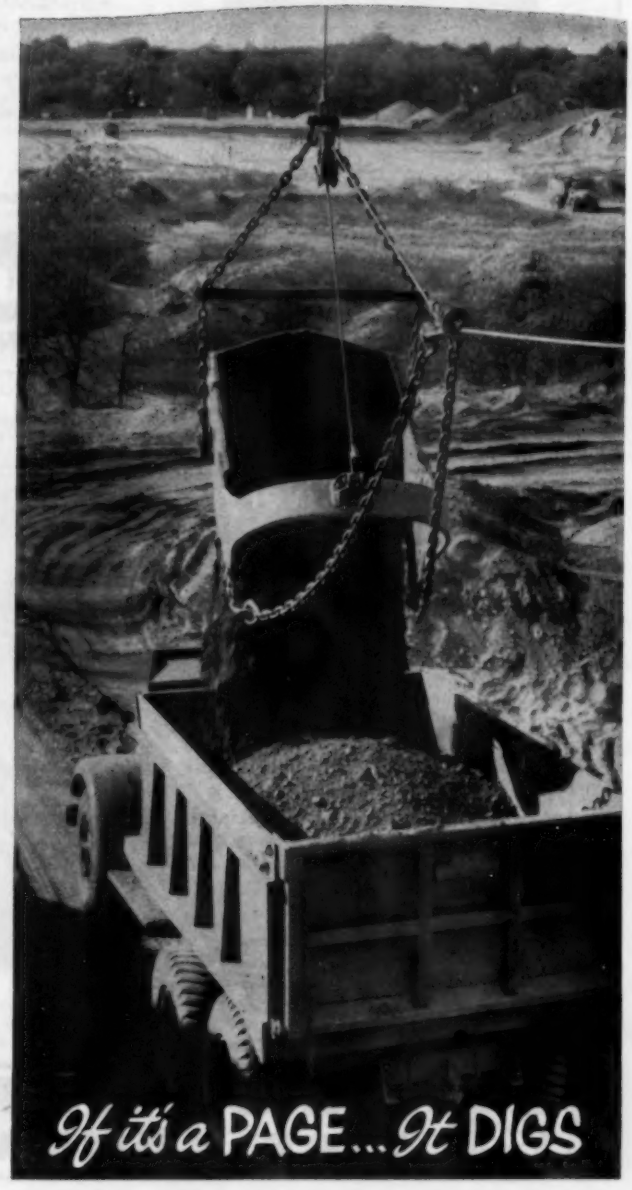
> "Our trucks are averaging 32,000 to 34,000 pounds per trip and are being loaded in 5 bucket loads. At 3000 pounds per yard, that's over 2 yards per bucket with a 1¾ yard bucket and each cycle averages about 24 seconds" says Mr. Pfeiffer.

When your machines are equipped with Page Automatic Dragline Buckets, they will produce more yardage with less wear and tear on the machine and operator PLUS increasing the productive working time of every haulage unit they serve.

Why not investigate the advantages Page Automatics can bring you? We'll put a Page on your machine and prove to your satisfaction that it outperforms any other dragline bucket. Write, asking for details and Bucket catalog GPB 454.

Page Engineering Co., Clearing P. O., Chicago 38

Page
Automatic Dragline Buckets
Walking Draglines



Increased* CEMENT PRODUCTION

BRADLEY HERCULES MILLS

The quickest, most economical way to increase your grinding capacity

For the cement manufacturer with excess kiln capacity . . . here is the answer to INCREASED CAPACITIES at an appreciable SAVING IN HORSEPOWER. The Bradley Hercules Mill, used as a preliminary pulverizer before compartment mills or tube mills, results in INCREASED PRODUCTION of finished material at a LOWER COST per barrel.

Rugged, dustless construction, maximum accessibility keep maintenance costs at an absolute minimum.

Automatic electrical feed control eliminates manual operation.

For complete information, write for Catalog No. 57

Bradley PULVERIZER CO.

LONDON ALLENTOWN, PENNA. BOSTON

Job Site Pickup . . .
Job Right Delivery

Southern Tire representatives pick up your worn tires at your job site after work hours, and return them guaranteed to equal new tire mileage . . . job right for long service!

You save the expense of equipment downtime, plus savings of 40% or more compared to the cost of new tires, when you specify Southern Tire's Retreading Service.

Let Southern Tire's retread specialists and superior facilities help you save time and money. Call your favorite dealer and specify Southern Tire Retreads.

Southern Tire's GIANT TIRE RETREADING

- **ROCK SERVICE, TRACTOR TYPES OR RIB TREADS**

All sizes from 1100x24 to 2700x33, and new sizes 29.5x25 and 29.5x29.

- **SUPERIOR 3-SECTIONAL* MOLDS**

Three-Sectional molds assure no buffing to breaker strips, regardless of growth.

SOUTHERN TIRE COMPANY

312 - 316 S. COURT STREET
FLORENCE, ALA.

PHONE COLLECT
Florence 85 or 86

1955 has been a year of change, consolidation and progress in both a corporate and a technical sense for Dorr-Oliver. Just a year ago we were deeply involved in the complexities of merger and, as we near the end of this first year of combined operations, a review has more than the usual significance.

Perhaps most notable has been the remarkable integration of our combined staff and its growing effectiveness in every area of operation. With this integration came important organizational change — the creation of new groups to handle technical problems more effectively and to explore new opportunities. With it also has come the strengthening of sales staff in some areas and the opening of new offices in others, designed to provide better service to our clients and customers.

Of the utmost importance in this rapidly developing picture is the welcoming of Dorr-Oliver-Long Limited as a full member of the worldwide D-O family. The natural result of a close and friendly relationship dating back to 1911, the consolidation of our Canadian operations with those of E. Long Limited of Orillia on January 1, 1956, will unquestionably strengthen our overall operations.

PULP AND PAPER — In 1955, field testing and subsequent commercial acceptance of the Webwelder for splicing corrugating medium and other heavy grades of paper was among our most significant projects. Contributing heavily to our volume of business were new or expanded Recausticizing Systems in the Pacific Northwest, Southeast, Canada, India, Sweden, Finland, Mexico and Chile. Next year the Horizontal Filter, already used for washing cotton linters, will be applied to pulp washing in a Southern mill.

INDUSTRIAL WASTES — Also in the pulp and paper industry, the largest biological kraft mill waste treatment plant in the world went into operation at West Virginia Pulp and Paper Company's Covington, Virginia, mill. And on the West Coast the most comprehensive treatment plant ever designed is now on stream handling wastes from an oil refinery. Both are D-O equipped. Orders were placed for waste treatment units to serve a midwest cannery and a large Eastern photographic equipment manufacturer.

PETROLEUM — The newly introduced D-Sander has proved to be extremely successful in removing sand from rotary drilling mud and has been widely utilized in the Gulf Coast oil fields. Fabrication of the longest petroleum filters ever constructed — six 10′ x 22′3″ Olivers for dewaxing — was completed at our Hazleton shops. Research and development continued on a new and unusual type of hydrocarbon purification unit, the applications of which appear almost boundless in the petroleum industry.

URANIUM — During the year a large D-O equipped Canadian uranium mill went into operation and orders were received for processing equipment to be used at six other United States and Canadian mills now under construction or being expanded. Facilities at our Westport laboratories have been enlarged to handle all types of uranium extraction work and to process small quantities of material from ore through "yellow cake". In a closely related project — the production of rare earths — D-O equipment will be widely utilized in a plant under construction.

SUGAR — As a result of three years of development we have introduced the RapiDorr Cane Juice Clarifier designed with 30% less volume than conventional units. A number of these machines will be in operation in the coming 1956 campaigns. Our associates in Italy have sold two Continuous Carbonation Systems for beet sugar processing on the Italian peninsula and mills in India will clarify cane juice in units manufactured by D-O GmbH in Wiesbaden.

SANITATION — The Densludge Process of prethickening sludge is now operating at two full-scale Biofiltration plants in the Southwest with general improvement in overall plant performance an unexpected result of its use. Tests have been virtually completed on a new Degritting Clarifier to be placed on the market in the near future. The Refuse Treator, which was developed in Holland and which may soon become an integral part of the domestic D-O line, gives the sanitary engineer another tool for the accomplishment of his ultimate goal.

RESEARCH AND DEVELOPMENT — Fundamental research has continued on the unit operations basic to D-O equipment. While such work is necessarily of a long range nature, increased fundamental knowledge has already led to marked advances in the field of clarification.

In addition to improvement of basic units, the company is constantly investigating new lines which can be profitably integrated with our other business. Current projects include an investigation to determine the manner in which D-O can make further contributions to the Atomic Energy Program and development of an ingenious Dutch device for fine screening.

COPPER — Half a world apart — in Israel and Arizona — two D-O designed copper ore dressing plants, one a full-scale operation and the other a pilot plant, are now under construction. In the United States, three large concentrators in the Southwest ordered equipment for plant expansions and in the Belgian Congo the first FluoSolids System to roast copper concentrates prior to electrolytic recovery went into operation.

FERTILIZER — Missouri Farmers Association's new plant, proving ground for the Diammonium Phosphate Process, attained design capacity in record time at Joplin, Missouri. Utilization of this new process makes commercial production of unusually high analysis fertilizer from concentrated phosphoric acid possible for the first time. In Japan, two more D-O designed fertilizer plants went into operation and a third was under construction in Norway.

WATER TREATMENT — In the field of water purification, Caracas, Venezuela and Kansas City, Missouri have duplicated orders of previous years for plant expansions and new facilities now under construction in both India and Turkey will employ extensive D-O equipment. First installations of the PeriFilter System, introduced two years ago, have shown marked economies of construction and unusual adaptability to small plants.

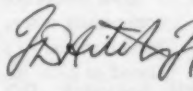
STARCH — Following the example of current practice in the Netherlands where the DorrClone was developed, five starch processing companies in other parts of the world ordered DorrClone Systems for their operations. Starch Washing Systems — each the first of its type in the various countries — will be installed in Brazil, Canada, Scotland and the United States. A fifth producer will use TM DorrClones to recover solids from starch washing filtrate in the U. S.

FLUOSOLIDS — Most significant achievement in the field of fluidization was the successful commercial demonstration of the first FluoSolids Coal Dryer. Equally adaptable to the drying of either metallurgical or steam coal, this unit will handle material as coarse as 1½″ with ease. During the year two other "firsts" were recorded — the first FluoSolids System went into operation in the Philippines and the first purchased for use in Germany. Repeat orders were received from companies in South Africa, Canada, Italy and Japan, and in the U. S. a large copper producer ordered its fourth complete System and seventh individual Reactor.

CHEMICAL — Expansion plans for alumina processing facilities in Jamaica and Germany, a potash counter-current decantation system in New Mexico, and new brine purification and pigment plants in the U. S. all incorporated substantial amounts of Dorr-Oliver equipment in their flowsheets.

Any pride we may feel in the events and accomplishments of the year is shadowed by the sudden passing of one of our Founder-Chairmen, Edwin Letts Oliver, late in the summer just past. His mechanical genius, strength and human warmth will be deeply missed by the engineering fraternity of the world. To Dorr-Oliver, and to those of us who knew him well, his loss is irreparable.

For the future, our resources are considerable. The initial enthusiasm and resourcefulness of our staff, the promise of new developments and the strength and solidarity of our Associates in Canada and abroad — all point to a steadily increasing ability to serve and an eventful year ahead.



Stamford, Conn., U.S.A.

We have a house to put in order...

WE HAVE A HOUSE to put in order . . . and it's the house where America lives.

Of our country's many million homes, more than 1 out of every 10 are out-and-out slums. Nearly one-half of all American dwellings are in poor to "fair" condition, and urgently need basic repairs.

Something *must* be done—both to correct the slums of today and *prevent* the slums of tomorrow.

How do slums start? Usually just one house starts to slide downhill and soon a whole block changes. Pride is lost. Other houses are neglected, decay spreads.

So the 20 million homes in need of basic repair and improvements deserve equal attention. The time to stop the spreading blight of slums is *before it starts.*

What's your stake in stopping slums?

If you think your town is different, just look around you . . . If you think slums only affect persons who live in them, think again.

Slums raise taxes and lower property values of the whole town. They raise rates of crime, delinquency and disease. *Everyone* has a real stake in stopping slums. And *that includes you as a businessman.*

Your firm is certainly dependent on the welfare of the community where you do business. But it's more than good business—it's good citizenship to take part in efforts aimed at civic improvements. It's the *responsibility* of every business.

What can your firm do? The answer to America's housing problems starts with individuals. But to roll back slums is such a big job it's going to take more than individual effort. It will need the cooperation of your business and many others.

Some slums should be torn down and a fresh start made. Others can be remodeled and made to conform to better living standards. So it is up to you to support every sound program which seeks adequate housing for all our people.

New help is now available

There is a new national, non-profit organization called A.C.T.I.O.N.—The American Council To Improve Our Neighborhoods—which is designed to help all individuals or groups interested in putting America's house in order.

Send for a free copy of "ACTION." It explains what A.C.T.I.O.N. is and proposes to do. It lists booklets, research, check-lists, and other material which can help you. Address P. O. Box 500, Radio City Station, New York 20, N. Y.

ACTION

American **C**ouncil **T**o **I**mprove **O**ur **N**eighborhoods

← P.B.P.*

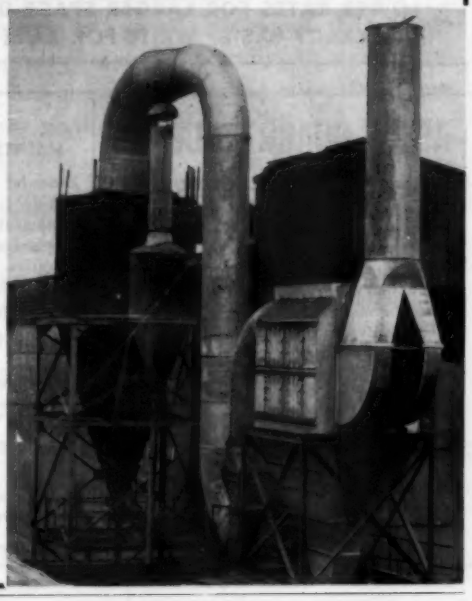
*{PROOF - - - - - BEFORE PURCHASE}

The photo above shows simple but accurate test equipment used by Dustex Corp. to pre-determine collection efficiency, hourly collection rate, and stack losses, if any, to be expected after installation of Dustex Collectors. Testing is performed under operating conditions, without interrupting production, and at no cost or obligation.

The photo at right shows a recently installed Dustex Collector, purchased after thorough testing as outlined above. The Dustex is installed secondary to a large cyclone, collecting natural cement fines resulting from a rotary kiln drying operation at the Louisville Cement Company of New York Plant, Akron, New York.

RESULT: End of serious dust nuisance *plus* saving of usable product.

See our *operating* exhibit at the N.C.S.A. Convention, Booth #55



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Make strong dust-tight, water-tight joints in belts of any width. Special design spreads tension uniformly across belt, allow natural troughing of belt and assures smooth operation over flat, crowned or take-up pulleys. Sizes for belts of from 1/4" to 1 1/2" thickness. *Write for Catalog Sheet.*

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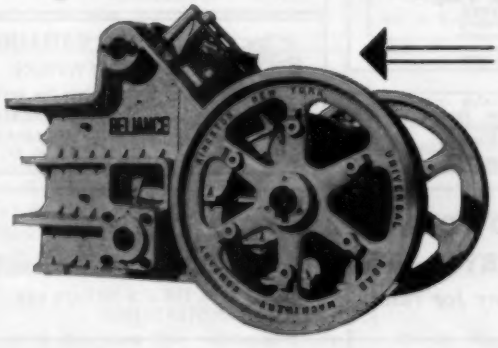

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Built to give life-time service with low-cost operation and maintenance

Crushing, Screening and washing plants from 50 to 1500 tons per day capacity.

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QUARRY ENGINEERS

Leading producer of sand and gravel in Chicago area needs experienced men to assist superintendents of large volume quarry operation, leading to top responsibility in near future. Some engineering or equivalent, and actual responsibility for production and supervision preferred. Opportunity for promotion, good salary, retirement income, insurance plans, and bright future. Reply, giving personal and work history and salary requirements.

BOX PQ-3015, c/o PIT AND QUARRY PUBLICATIONS
431 S. Dearborn St. Chicago 5, Ill.

WANTED

MAINTENANCE SUPERINTENDENT

Must be familiar with diesel engines, shovels, tractors, crushing and screening equipment, etc. To head maintenance program of Stone Quarrying and Crushing operation. Location: Mid-East. Salary plus Bonus. Please state salary required, experience, when available. First reply.

Box PQ-112 c/o PIT AND QUARRY PUBLICATIONS
431 S. Dearborn St. Chicago 5, Ill.

PROJECT ENGINEER WANTED

Graduate Mining, Metallurgical, Chemical or Mechanical Engineer, preferably 25 to 35 years old, wanted by medium size progressive heavy machinery manufacturing company located in Southeastern Pennsylvania. To assist in design and preparing for market of various lines of equipment used in mineral dressing, heavy chemical, cement and rock products industries. Must have had engineering and field experience, and be willing to work on drafting board, travel and do field service. Opportunity also exists for a properly qualified individual, eventually to become a sales engineer. Salary open.

BOX PQ-904, c/o PIT AND QUARRY PUBLICATIONS
431 S. Dearborn St. Chicago 5, Ill.

WANTED

SUPERINTENDENT for Medium size Central Ohio Quarry and Crushing plant. Must have ability to handle men, maintain and supervise entire operation. State qualifications, references and salary expected in your first letter.

BOX PQ-103 c/o PIT AND QUARRY PUBLICATIONS
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POSITION WANTED

Superintendent, and Engineer. 20 years experience in stone industry. Appraisals, Design, Construction, Blasting, Quarrying, Crushing, Screening, Maintenance.

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Ph. FR 2-4186

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BULK MATERIALS HANDLING
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Leading manufacturer of machinery located in Milwaukee, Wisconsin area has opening for Sales Engineer, 30 to 40 years of age, who has had several years experience in sales of heavy machinery. Must have degree in mechanical or mining engineering. This represents an exceptionally fine opportunity which should lead to administrative responsibilities for right man. Write, stating age, education, experience, present employment, personal data and salary expected to start. Replies strictly confidential.

Box PQ-101 c/o PIT AND QUARRY PUBLICATIONS
431 S. Dearborn St. Chicago 5, Ill.

MINING SAFETY ENGINEERS

Needed for California Division of Industrial Safety. Requires two years' safety engineering or three years' engineering experience in mining, tunnel construction, or quarry operations and college degree. Additional experience may be substituted for required education. California residence not required but civil service examination and interview will be held in California only. Write.

CALIFORNIA STATE PERSONNEL BOARD
801 Capitol Ave.
Sacramento 14, Calif.

WANTED
CRUSHED STONE-SAND AND GRAVEL PRODUCTION MANAGER

To work as assistant to our vice president in charge of production in a large volume, sand and gravel operation in the Chicago area. This position represents a real opportunity to a successful man under 45, who has already attained advancement above the average in the stone production field. A degree in mechanical engineering is desirable.

This is a permanent position with a successful, aggressive organization which provides a unique profit sharing plan and a promising future. Little or no travel is involved. Please give qualifications in detail, together with last salary. Replies confidential.

Box PQ-113 c/o PIT AND QUARRY PUBLICATIONS
431 S. Dearborn St. Chicago 5, Ill.

WANTED

MECHANICAL OR CHEMICAL ENGINEER to control operations and production of wet and dry grinding limestone plant. Experience in cement, pigment and allied fields desirable. Located in Middle Atlantic States. Write giving complete details of education, experience and salary expected, to

Box PQ-108, c/o PIT AND QUARRY PUBLICATIONS
431 S. Dearborn St. Chicago 5, Ill.

WANTED

3' SYMONS SHORT HEAD CRUSHER
Coarse Bowl

Box PQ-1015, c/o Pit and Quarry Publications
431 S. Dearborn St. Chicago 5, Ill.

WANTED

3' Symons cone crusher or equal, complete with drive.

TOWANDA SAND & GRAVEL CO., INC.
Towanda, Pa.

WANTED

GENERAL SUPERINTENDENT to assume full responsibility for operations and production of wet and dry grinding limestone plant. Experience in cement, pigment and allied fields desirable. Located in Middle Atlantic States. Write giving complete details of education, experience and salary expected, to

Box PQ-109, c/o PIT AND QUARRY PUBLICATIONS
431 S. Dearborn St. Chicago 5, Ill.

WANTED

Superintendent for large Stone Quarry and Crushing Operation. Must be qualified to do blasting and to supervise entire operation. Location in Eastern State. Please advise experience and capabilities and salary expected.

BOX PQ-1025 c/o PIT AND QUARRY PUBLICATIONS
431 S. Dearborn St. Chicago 5, Ill.

Wanted

42" Gyratory Crusher

The National Lime & Stone Co.
Findlay, Ohio

WANTED

Maintenance Superintendent. Must be familiar with power shovels and stone crushing and screening equipment. Must be capable taking full charge of Machine Shop in Stone Quarrying and Crushing Operation. Location in Eastern State. Please advise experience and salary expected.

BOX PQ-1026 c/o PIT AND QUARRY PUBLICATIONS
431 S. Dearborn St. Chicago 5, Ill.

WANTED

USED LOCOMOTIVE
30 TON STANDARD GAUGE
DIESEL-ELECTRIC

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FOR SALE

DRILL BARGE, 25' x 60', equipped with Ingersoll Rand Air Compressor, Diesel Powered and 4 Gardner Denver DH123 Rock Drills, air powered spuds and winches for moving. Now in use on Canal Rock Digging Job in Florida. Priced to sell. Available immediately.

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Recent engineering M.E., C.E., or mining graduates to train and work on variety of stimulating assignments in industry producing building materials in Chicago area. Eventual responsibility for all phases of work, from layout and design to tryout. Will work both in the field and inside. Excellent prospects for growth and future attainment of administrative position.

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GRINDING MILLS

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ROD MILLS—3x10, 4x7, 4x14, 5x10, 5x14, 6x12 & 9"x12'. Also 5"x12'.
3—Denver 36"x54".
TUBE MILLS—3'x12', 5'6"x22', 5'x18' & 6'x22'

HAMMERMILLS

13—Jeffrey 30x24, 30x36, 36x36, 36x48, 42x36 & 42x48.
WILLIAMS GA30—24x30 & GA60—24x60.
DIXIE 5040—MOGUL 50x40 & 30x30.
GRUENDLER 5XD—48x30 & 1—6XA—30"x30".
3—PENNA. 6XH—100 TPH.
UNIVERSAL No. 4—36x36.
PENNA. THOR 8XT 18-48. Also 48x84.

APRON FEEDER

3—8'x8', 5'x12' & 54"x16'3".

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5 Sturtevant 10', 14' & 16'.
4 Gayco 8', 6' & 5'.
1—12 D Roto Clone.

FILTERS, SEPARATORS—CLASSIFIERS

11'6"x18', 14'x18' & 8'x10' Oliver Drum Filters.
8'x20' Dorr DSD Duplex Classifier.
6'x14' HARDINGE COUNTER CURRENT.
DINGS MAGNETIC TYPE IR 3 STAGE 60".
THICKENER. ALSO 3 DORR & 28'x10'.
RAKE & BOWL CLASSIFIERS. 2x15 SSFB. 6x22 DSF DORR 8x24'. 10"x16" TURRENT BOWL.
36"x19'2" Wemco Spiral Classifier.
16—5'x25', 8'x36' & 8'x20' Rake Classifiers.
9—Turrett Bowl Classifiers 3'x24'10"x16', 3'x24'x12', 4'6"x26'x16', & 5'x31'x24'.
17—Thickeners Dia. 100', 80', 30', 24', 16', 12'.
3—Hydro Separators 60"x45' & 20'x8'.
3—Wemco 10'x50' Sand Launders.

ROTARY DRYERS & KILNS

ROTARY KILNS: 4'x28', 6'x28', 6'x8'x60', 9'x125', 3—9'x30', 4'x29', 6'x8', 8'x7'x60' 8'x125', 2—7'x110'.
ROTARY DRYERS: 3'x30', 4'x20', 4'x40', 5'x35' 6'x40', 6'x30', 11'x75', 4'x20', & 80"x80'.

JAW CRUSHERS

BLAKE TYPE—60x24, 60x48, 42x40, 48x60, 24x36, 18x36, 15x30, 12x30, 12x24, 12x16, 10x20, 30x42.
SINGLE SHAFT—18x36, 15x36, 15x30, 10x40, 10x30, 10x20.
CAM & ROLLER—24x40, 14x30, 11x30, 10x20, 6x20

GYRATORY FINE REDUCTION CRUSHERS

NEWHOUSE 7", 10", 14"—KENNEDY 19S, 25S. 27—SUP. McC. 4" & 10" AL. CHAL. 22R. TRAYLOR TT 36".

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6", 10", 14", 16", 20" & 36" SUP. McC.—GATES AL. CHAL. 2, 4, 5, 6, 7½, 8, 12K.
PARTS FOR 42" SUPERIOR McCULLY.

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NIAGARA AC—ROBINS—LINK BELT—2x5, 2x8, 3x8, 3x10, 4x5, 4x8, 4x10, 4x14, 4x16, 5x8, 5x10 & 5x16, 1-2-3 & 4 Decks.

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9—18 Ton & 19 Ton Plymouth Diesels.
1—65 Ton & 5—45 Ton G.E. Diesel Elec.
10 TON DAVENPORT & 25 Ton Plymouth Gas
3—14 Ton Brookville Diesels. Also 10 Ton Diesel.
8—PLYMOUTH GAS. 6 - 8 - 10 TON.
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30 TON OHIO STEAM. 50 FT. BOOM.
25 TON AMER —30 TON OHIO DIESELS.

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7—42 In., 30 In., 24 In., 18 In

STEEL DERRICKS

GUY: 2 TON 85 FT. BOOM. 25 TON 60 FT. BOOM. 15 TON 100 FT. BOOM. 20 TON 115 FT. BOOM. 50 TON 100 FT. BOOM.
STIFF LEG: 5 TON 70 FT. BOOM. 15 TON. 100 FT. BOOM. 25 TON 100 FT. BOOM. 75 TON 135 FT. BOOM. 1—8 TON 100 FT. BOOM.

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Bucyrus-Erie 54-B, 3 yd. diesel dragline, 80' boom, long wide crawlers, excellent condition S/N 86672, new 1951. Write:

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10' x 200' x ¾" comb. chamber.
7'6" x 110' x ¾" Rotary Kiln.
5' x 67' x 5/16" with lifters.
5' x 40' x ⅜" with lifters.
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5' x 20' Baker Cooler.
310-12 Link-Belt Roto Louvre.
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52' c/c 5x5 buckets on 6" belt.
50' c/c 8x5 buckets, complete.
42' c/c 4x4 buckets, gear drive.
32' c/c 4x4 buckets on 7" belt.
26' c/c 8x6 buckets, steel case.

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Dixie 36" x 50" Hammermill.
Hardinge 10' x 48", 7' x 36", 6' x 22".
Patterson 6' x 8' Ball Mills (3 avail.).
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Tyler 4 x 7 with thermionic unit.
Tyler—5 x 12, 3 x 10 wet type.
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8' x 10' Oliver Rotary Filter.
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FARREL-BACON JAW CRUSHERS
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BACON-PIETSCH Co., Inc.
Engineers & Manufacturers *Send for Catalogue*
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Machine Shop Facilities
FEEDERS
Conveyors, Screens, etc.

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#480 Marion Electric Shovel with Ward-Leonard Control.

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CRACKS REPAIRED
MACHINED READY-TO-INSTALL
VALVE GRINDING PRESSURE
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CHAPIN CYLINDER HEAD CO.
PHONE # 3
9 Miles West of Jacksonville in
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1 EAGLE 7' x 20' LOG WASHER OF WELDED STEEL CONSTRUCTION COMPLETE WITH BOX TYPE LEGS, REPLACEABLE CORRUGATED NI-HARD SHOES, ANTI-FRICTION BEARINGS, CUT TOOTH STEEL GEARS, DUST RIGHT GEAR CASES, INTEGRAL MOTOR MOUNT 60 H.P. 1160/1200 R.P.M. 3/60/220-440 VOLT OPEN DRIP PROOF ELECTRIC MOTOR AND V-BELT DRIVE, SERIAL NUMBER 3203. BRAND NEW, PURCHASED JUNE 1955, NEVER USED. F.O.B. CARS OMAHA, NEBRASKA. LIST PRICE $11,700.00 *less* $1,000.00. Reason selling — SPECIFICATION CHANGED, WASHING NOT REQUIRED.

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Phone Jackson 4975

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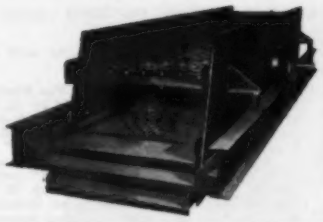
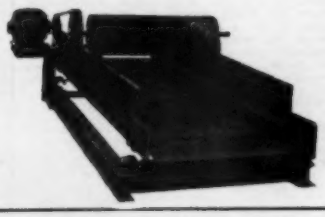
IMMEDIATE SHIPMENT FROM OUR FACTORY — WRITE, WIRE OR PHONE

NEW BONDED® HEAVY DUTY VIBRATING SCREENS



Model Number	Screening Area	No. of Decks	Sale Price
124AS	2' x 4'	1	$355
224AS	2' x 4'	2	375
126AS	2' x 6'	1	375
226AS	2' x 6'	2	395
136AS	3' x 6'	1	495
236AS	3' x 6'	2	585
336AS	3' x 6'	3	815
138AS	3' x 8'	1	575
238AS	3' x 8'	2	695
338AS	3' x 8'	3	845
138BS	3' x 8'	1	1119
238BS	3' x 8'	2	1165
338BS	3' x 8'	3	1250
248BS	4' x 8'	2	1695
348BS	4' x 8'	3	1850
2410BS	4' x 10'	2	1775
3410BS	4' x 10'	3	2095
3412BS	4' x 12'	3	2395

NEW BONDED® GENERAL DUTY VIBRATING SCREENS



For mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operation, wet or dry. HEAVY DUTY MODELS, TYPE BS: 4-bearing positive throw, eccentric shaft; 3' x 8' to 5' x 14', 1 to 5 decks. GENERAL DUTY SCREENS, TYPE AS: eccentric weight mechanism, spring mounted, 1 to 3 decks, 2' x 4' to 3' x 8'. Write for new 8-page Bulletins 1086 and 1087.

BONDED CARRIES LARGE STOCKS OF SCREEN CLOTH FOR IMMEDIATE SHIPMENT

NEW BONDED® TROUGHING IDLER CONVEYOR BARGAINS

Complete Ready-Fab sections quickly and easily joined together on the job. We take our loss on our stock of short length belting. You can save as much as 50% on the BONDED CONVEYOR SPECIALS listed, with conveyor belting in two pieces. Conveyors are equipped with 5" roll diam. idlers and return rolls, 20" diam. head pulley and 16" diam. tail pulley mounted on 2¼" or 2-7/16" diam. shaft. Belt is new 4-ply, 28-oz. duck, 1/8" top rubber cover x 1/32" bottom cover and is fresh stock made by leading manufacturers.

Remember, You Save Up To 50%

CONVEYOR PRICES INCLUDE BELTING

Belt Width	Length of Conveyor	List Price	Sale Price
14"	25'	$1166	$ 672
14"	50'	2016	1064
16"	45'	1928	1012
16"	60'	2494	1264
18"	25'	1327	739
18"	45'	1906	1085
18"	85'	3466	1798
20"	25'	1366	770
20"	60'	2762	1426
24"	25'	1428	835
24"	45'	2227	1237
24"	100'	4425	2339
24"	130'	5624	2995
30"	50'	2669	1504
30"	70'	3578	1971

For conveyors longer or shorter than those listed above, add or deduct the following per foot prices according to belt width. Prices include belting.

For 14" belt	$15.66	per foot
For 16" belt	16.78	per foot
For 18" belt	17.20	per foot
For 20" belt	18.95	per foot
For 24" belt	20.66	per foot
For 30" belt	23.02	per foot

BONDED CONVEYOR ACCESSORIES

All Bonded Troughing Conveyors (described above) can be equipped with Bonded Accessories or use them on your present Conveyor or Bucket Elevator.

Holdback $90.00

Guide Idler $13.75

Wing Pulley $74.00

NEW CONVEYOR BELTING SAVE UP TO 25%

Heavy duty 4-ply, 28 oz. duck 1/8" top rubber cover x 1/32" bottom cover rubber belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stock.

Width	List Price	Sale Price
14"	$3.43 foot	$2.75 foot
16"	3.86 foot	2.88 foot
18"	4.27 foot	3.19 foot
20"	4.69 foot	3.69 foot
24"	5.55 foot	4.14 foot
30"	6.77 foot	5.06 foot
36"	8.01 foot	6.00 foot

Additional widths and plies available at low prices. Write for free sample.

NEW BONDED® FEEDERS

For high tonnage and controlled feed of Aggregate, Sand, Gravel, Crushed Stone, Clay products, Metallic Ores, Coal, Cinders and almost any other bulk material to Crushers, Screens, Conveyors, Mills and other process machinery. Feeder may also be driven from tail shaft of Bonded® Troughing Idler Conveyors thus eliminating the necessity of two motors. Capacities to 225 tons per hour. Full information in Bulletin 938. Write for it.

Priced from $280.00

NEW BONDED® FLIGHT CONVEYORS

Heavy Duty Flight Conveyor

Mobile Tire-Mounted Drag Chain Conveyor

Bonded flight conveyors are made in portable and stationary models. Any length. Flight sizes up to 8" x 24". Made of welded structural and sheet steel with heavy duty double guided chain.

Priced from $421.00

NEW IDLERS AND RETURN ROLLS 25% BELOW LIST PRICE

3-roll, 5" diameter Troughing Idlers for:

14" belt	$17.25	24" belt	$19.75
16" belt	18.00	30" belt	20.50
18" belt	19.00	36" belt	21.25
20" belt	19.25	48" belt	23.75

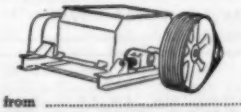
1-roll, 5" diameter Return Idlers for:

14" belt	$6.75	24" belt	$ 8.00
16" belt	7.00	30" belt	8.75
18" belt	7.50	36" belt	9.25
20" belt	7.75	48" belt	10.75

All steel. Interchangeable with other well-known makes. Replaceable ball bearings. Either sealed type (pre-lubricated) or with alemite fittings. Maintenance is negligible.

NEW BONDED® CINDER, STONE PUMICE, PERLITE CRUSHERS

Bonded double roll crushers are available with Tooth, Smooth, Fine or Coarse Corrugated rolls or any combination of same for crushing Lightweight Aggregate, Pumice, Perlite Chemicals, Limestone Chips, some Stone and similar materials. Capacities to 500 tons per hour. Write for new eight page Bulletin 1119.



Priced from $478.00

NEW BONDED GEAR REDUCERS

H.P. At 20:1 Ratio	H.P. At 30:1 Ratio	Price
3	2	$ 91
5	3	142
10	7½	228
15	10	286
20	15	394
25	20	468
30	25	575
40	30	750
60	50	925

Reducers are right angle with worm on bottom (underdriven) and all models are fan cooled by means of a radial fan. Reducer will operate in either direction. Other sizes and ratios available at bargain prices.

VISIT THE BONDED FACTORY ANY TIME — BONDED MACHINES AVAILABLE ON TIME PAYMENT PLAN

BONDED SCALE AND MACHINE COMPANY

PHONE: Hickory 4-2186 Days; WRITE FOR FREE CATALOG AND PRICES PHONE: AX minster 1-2213, Evenings

110 Bellview Mfgrs. of Scales, Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers and Feeders Columbus 7, Ohio

P. & H. #1400 DE. shovel, 5 and 6.86 cu. yd. dippers. Orig. new cost 1950. $232,000.00. Used two years on one job only. Overhauled and idle since then. Bargain $76,000.00. Southern Texas. Also P. & H. #1055 Shovel available.

MARION #362 1¼ cu. yd. shovel. Cat. D13000 Ser. #8468. Rebuilt. New center pin, bushing. Gears, bands 50% and better. $18,000.00.

NORTHWEST #80D. 2½ yd. shovel, #12688. Very good. $26,000.00. Our yard.—Also #8992 as above, but entirely rebuilt from ground up at a cost of over $14,000.00—$27,500.00 Southern Texas. Rental purchase.

UNIVERSAL #3240 IMPACT Master portable Crushing plant w/ 2½' x 12' feeder underconveyor, tandems 5th Wheel. $18,000.00. Wisconsin.

LIPPMANN 24" x 36" RB. Jaw Crusher. Good. $5000.00. Our yard.

UNIVERSAL 24" x 36" RB Primary Portable w/ apron feeder, underconveyor, Cat. Diesel. Tandem Pneumatic Air brakes. Good. $15,000.00 Consider rental purchase-monthly or yardage.

UNIVERSAL Secondary Portable. Tandem pneu. Air brakes. 30" x 18" RB. double roll. #3 Hammermill. 844 C. Buda Diesel and cat 4600 Generating plant. Good. $15,000.00. Rental purchase yard.

ROGERS 2-Unit Portable. 2436 RB. Jaw 4022 RB Double Roll. Diesel Power. Like new—bought a year ago and only used 40,000 tons. Cost $70,000.00.—Our price $50,000.00. Rental purchase. Also single Unit Rogers 20" x 36" w/ hammermill, screen. Used 200,000 tons. Yard.

AUSTIN-Western 18" x 38" RB. Jaw Crusher w/ 4' x 10' Apron Feeder. 60 H.P. & 15 H.P. Electric motors. Excellent. $6,000.00 Colorado.

UNIVERSAL TDM Portable Gravel plant. 1024 RB. Jaw, Tandem double rolls. 24½ x 16 & 24 x 14. GMC diesel. Late model, used little. $20,500.00. Wisconsin.

IOWA Portable Self propelled 9 x 15 Jaw Crusher w/ IHC— 1020 tractor, bucket elevator. Good. $850.00 Yard.

ROGERS 10 x 20 Jaw Crusher w/ IH P20 Engine & 25' bucket elevator, steel frame. Good $850.00. Yard.

CEDAR RAPIDS Jr. Tandem Gravel plant. 1036 RB. Jaw, 2416 RB. Double roll. Cat Diesel. Rebuilt. $19,000.00 Arkansas.

STATIONARY Crushing plant. ROGERS:—20 x 36 RB Jaw, feeder, 70' x 24" lattice type conveyor, #3030 Hammermill, 4' x 10' 3-deck Seco screen. Complete. New 1948. Used around 250,000 tons. Excellent condition. Sell or each item separately.

JOY 630 CFM. Portable Compressor, Cat., D337 Diesel. Pneumatic tired trailer. A1. Rent $500/mo. on purchase price $7,000.00.

JAEGER 210 ft. Portable Compressor, Cat. Diesel. Pneumatic tired. Rent $200/mo. on purchase price, $2,250.00

GRUENDLER 30 x 18 RB, Double Roll. New shaft, bearings. $3,750.00. Yard.

TELESMITH 9 x 36 RB. Jaw Crusher. Good. $1,850.00. Yard.

GELSON No. 14" Hammermill. Like new. $500.00. Yard.

UNIVERSAL #3 Hammermill. Good. Has three rock grates, 5 sets of lime grates. New bearings & shaft recently installed. $1,000.00. Yard.

GRUENDLER 3XH Hammermill. Very Good. $600.00. Yard.

ROGERS 10 x 18 p.b. Jaw Crusher. Good. Jaws like new. $450.00. Yard.

SIMPLICITY 4' x 10' 3-deck Vibr. Screens Model D A1. $1,500.00. Yard. 5' x 14' 2-deck Vibr. Screens $2,000. Michigan.

SELECTRO 3' x 8' 3-deck Vibr. Screen. Like new. $1,400.00. Yard.

WENZEL MACHINERY RENTAL & SALES CO.

565-567 South Tenth Street

Kansas City, Kans.

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BRAND NEW

JACK HAMMERS

List price approx. $430.00

Sale price **$245.00**

Cleveland model H 111

55 lb. all with 1' x 4¼" chuck

25% with order balance C.O.D

HAYNES EQUIPMENT CO., INC.

58-62 VOORHIS LA.

HACKENSACK, N.J.

RELAYING RAIL

Track Accessories

All Sizes

LEFTON INDUSTRIAL CORP.

General Office: 212 Victor Street

St. Louis 4, Missouri

1—30x42 Buchanan Jaw Crusher, Blake Type.
1—24 x 36 Telsmith R.B. Jaw Crusher with 3' x 12' Feeder.
1—10" Telsmith Gyratory Crusher.
14—26 Acme Jaw Crusher.
10—20 Crusher, Blake Type.
2—32" Telsmith Gyratory Crusher.
1—24" Telsmith Grysphere Crusher.
16" x 16" New Holland Double Roll.
1—20" x 24" New Holland Rolls.
1—18" Intercone Crusher.
1—3' Symons Cone Crusher.
1—3' x 10' D.D. Telsmith Screen.
1—4 x 12 S.D. Telsmith Screen.
60" Telsmith Sand Drag.
1—7x10 Allis Chalmers Crusher, Blake Type.
1—Model 543 Barber-Greene Bucket Loader.
6—Ton Huber Roller, 3 Wheel.
1—40x42 Farrel-Bacon Jaw Crusher.
1—20x36 Pioneer Jaw Crusher.

BLUE BALL MACHINE WORKS, Blue Ball, Pa.

LOCOMOTIVES: 2—ALCO 125 ton, 1000 H.P. McIntosh Seymour diesel with G.E. electric equipment. Sale or rent.

COMPRESSORS: 2—210 ft. and one 105 ft. electric, stationary, with 50 H.P. and 25 H.P. motors and starters. Like new.

TUBE MILLS: Allis Chalmers 5 ft. & 22 ft. with steel heads.

SHOVEL: Bucyrus Erie 120-B electric, 4 yd. capacity, 2200 volt, A.C.

DRYER: 5 ft. & 30 ft. complete with all equipment.

PAN FEEDERS: 1—Manganese Pan Feeder, heavy duty, 60" x 15 ft. with 20 H.P., 220/440 volt motor, speed reducer, V-belt drive. Condition like new. 1—Link Belt heavy duty Ore or Rock Feeder, 36" x 10 ft., 5 H.P. motor, speed reducer and drive. 1—Apron Pan Feeder 48" wide, 110 ft., 75 FPM, lift 20 ft., 100 H.P., 220/440 volt motor, Jones Speed Reducer, 63 H.P., ratio 28.7, with structural support.

REDUCTION CRUSHERS: Allis Chalmers R543 Hydrocone, with large stock new parts, condition like new. Will sell parts separately. Symons 2 ft. Cone Crusher, standard, with 25 H.P. motor and drive.

JAW CRUSHERS: Allis Chalmers 18 x 30 sectionalized for underground use, V-belt, 50 H.P., 220/440 volt motor, new condition. Also, 48 x 60", 41 x 40", 36 x 48", with or without motors and drives. Other sizes from 4" x 6" to 48" x 60".

SCREENS: Tyler and Allis Chalmers, 4 x 5', 3 x 10', 3 x 12', 4 x 12', 5 x 12'.

LOCOMOTIVE CRANE: 25 ton capacity, standard gauge, gasoline powered, cast steel trucks, air brakes, with or without 1¼ yd. Williams clam shell bucket, thoroughly modern, excellent condition. Located Minnesota. For sale or rent.

MINE HOISTS: Single and double drum, 100 to 1500 H.P., with all electrical equipment. Complete specifications, drawings, photos available.

HOIST MOTORS:
300 H.P., 435 RPM. 600 H.P., 710 RPM.
400 H.P., 588 RPM. 1200 H.P., 444 RPM.
2200 volt, A.C. with controls.

We Buy and Sell Equipment Throughout North and Central America

A. J. O'NEILL

Lansdowne, Pa.

Phila. Phones: MAdison 3-8300 - 3-8301

DEPENDABLE USED MACHINES

Special:—Lessman loader, hydraulic steer; dual transmission; 52" bucket, used 3 months.

A-W ⅜ yd. gas shovel	Pioneer port. Diesel gravel plant	B-G #82 loader
Insley K-12 dragline	Pioneer-Mesabi 5x12 d.d. screen	Eagle cinder crusher
Northwest truck crane	Cedar Rapids 16x16 roll crusher	Seco 5x16 screen
Unit 1020A dragline	Bay City ½ yd. Diesel backhoe	2 yd. Dumperete
40' bucket elevator	Kochring 1⅛ yd. Diesel dragline	Butler fork truck

These machine reconditioned in our newly-built daylight plant. Come see them!

10004 Southwest Highway **TRACTOR & EQUIPMENT CO.** **Oak Lawn, Ill.**

FOR SALE

1938 AUSTIN-WESTERN JAW CRUSHER WITH 75 H. P. ELECTRIC MOTOR: ALSO, FEEDER AND SPEED REDUCER WITH 15 H. P. ELECTRIC MOTOR, AND 2-COMPARTMENT BIN $5,000.00

LORAIN 820 SHOVEL WITH 2½ YD. BUCKET, COMPLETE WITH 85 FT. DRAGLINE BOOM, EXCELLENT CONDITION $30,000.00

GARDNER-DENVER DOUBLE DRUM AIR HOIST COMPLETE WITH DRIFTER AND FEEDER ..... $ 500.00

ROCK RACK FOR D-8 ..... 500.00

HYSTER FOR D-8 ..... $2,500.00

HYSTER FOR D-7 ..... $2,000.00

1¼ YD. BYERS DRAGLINE, GOOD FOR SPARE PARTS, SOME NEW PARTS $1,000.00

HERCULES GAS MOTOR MODEL TXO, JUST OVERHAULED ..... $ 500.00

30 YD. ROCK BIN WITH HYDRAULIC GATES AND PUMP ..... $ 700.00

All Equipment Listed is in A-1 Condition.

CASS COMPANY, CONTRACTORS

Box 547, Golden, Phone Crestview 9-3612

or

315 W.O.W. Bldg.

Omaha, Nebr.

Telephone Jackson 4975

21x36" Portable Crushing Plant & 16x20", 10x36"—18x36"—20x36" Jaw Crushers.
275 HP. Cummins Diesel with Clutch.
18"x30' Portable B/G Conveyor.
#3 Universal Hammermill.
18x30" & 30x30" Roll Crushers.
#848 B/G Pugmill & Gradation Unit.
20 & 30 HP. Self-contained Boilers.

H. & P. 6719 Etzel, St. Louis 14, Mo.

WANTED TO BUY

for immediate export

One Over-head Crane 50' to 70' span, app. 10 ton equipped with 2 hoist drums for clam shell operation.
Two Portable Rock Crushers 40 to 60 cu. yds. per hr.
One Steam Engine for power drive, 100 to 150 HP.

Wire, write or phone

Attn. Mr. Earl A. Carpenter

INTER-AMERICAN MACHINERY COMPANY

100 Broadway, Houston 12, Texas

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For Sale

EUCLID REAR DUMP TRUCKS

Model 9W BUCYRUS-ERIE Dragline, 8 yd.
Model 1055 P & H Shovel & drag, 3½ yd.
Model 1600 P & H Shovel, 6 yd.
Model 54B BUCYRUS-ERIE Shovel, 2½ yd.
Model 64B BUCYRUS-ERIE Dragline, 2½ yd.
Model 36B BUCYRUS-ERIE Shovel, 1½ yd.
Model 120B BUCYRUS-ERIE Shovel & Drag, 3 yd.
Model 170B BUCYRUS-ERIE Shovel, 6 yd.
Model 200B BUCYRUS-ERIE Dragline, 5 yd.
Model 5-W BUCYRUS-ERIE Dragline, 6 yd.
Model 4560 MANITOWOC Dragline, 3 yd. & 5 yd. shovel.
Model 4181 MARION Shovel & drag, 3 yd.
Model 7400 MARION dragline, 9 yd.
Model 80-D NORTHWEST shovel, 2½ yd.
Model 6 NORTHWEST shovel, 1½ yd.
Model 1201 LIMA dragline, 3½ yd.
Model 3500 MANITOWOC dragline, 2½ yd.
5 yd. Dragline, excellent condition, $33,000.00.
CATERPILLAR GRADERS
ROGERS Lowbed trailer.

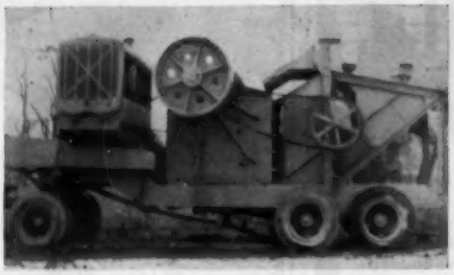
WILLIAM LUBRECHT, III

Construction Equipment

311 W. Diamond Ave. Hazleton, Pa.

Phone: GLadstone 5-4041 or 5-0253

FOR SALE DIAMOND PORTABLE CRUSHING PLANTS



Diamond #24 primary plant equipped with D13000 Cat Diesel power 24 x 36 jaw crusher; discharge conveyor.

Diamond standard 66 Plant equipped with G.M.C. 6031C Diesel power unit; 4 x 12 double deck shaker screen; 10 x 36 jaw crusher; 30 x 18 roll crusher; feed conveyor; return conveyor; closed circuit.

Diamond 95 portable plant (not pictured) equipped same as 66 plant but with greater capacity.

New 1950—crushed material for one job. Will sell at discount to move immediately. Plants owned by:

DALRYMPLE GRAVEL AND CONTRACTING CO., INC.

Located at: Elmira, New York

SPECIALS
1—Allis-Chalmers 8'x7'x22' two compartment mill and motor
2—New 6½'x180' Kilns
1—Complete Lime Hydrating Plant
1—#6 Williams Hammermill
1—7'x24' Tube Mill and Motor

KILNS
1—4'x40', 9'x100' Kilns.

DRYERS
1—4½'x30', 7'x60', 8'x125'.

CRUSHERS
1—60"x48" 36"x42", 30"x36", 24"x36", 12"x36", 12"x24" Jaw Crushers
2—42"x16" Allis-Chalmers Crushing Rolls
2—24"x14" Rogers Iron Works Crushing Rolls
1—36"x16" rebuilt Sturtevant Rolls
1—24"x12" Farrell Bacon Crushing Rolls
1—No. 322 Allis-Chalmers
1—6", 10", 16" and 20" McCully Superior Gyratory Crushers
1—48" Telsmith Gyrosphere Crusher No. 8 up to No. 12 Gyratory Crushers

BALL, ROD & TUBE MILLS
6'x12', 5½'x10', 8'x6' Ball Mills
2—5'x16'; 1—5½'x19'; 1—6'x12' Rod Mills
2—5½'x20' and 5'x22' Tube Mills
1—10'x48', 8'x36" Hardinge Mill
3—3-Roll Bradley Hercules Mills, Direct Connected to 300 HP Motors

MISCELLANEOUS
1—6' & 14' Air Separator
8'x19', 6'x8', 12'10' Oliver Filters

We Make New Dryers, Kilns, Dust Collectors

Have you any machinery that you want to sell?

W. P. HEINEKEN, INC.
50 Broad St. New York 4, N. Y.
Phone Whitehall 4-4236

CRUSHING PLANTS, 120 TPH Rogers, Pitmaster, Diamond 95, Pioneer 40V, Univ. 880.
CRUSHERS: 1020 AC, 1218 Acme, 1524 Univ. 1536 Diamond, 1836, 2036 CR, 2436 Lippman 2536 Telsmith, 3648 Diamond, 4860 Traylor JAW. 1'8" & 2'4" Traylor, 10, 16, 20, 30 & 36" McCully, 16B Telsmith GYR. 2 & 3' CONE 3018, 4022 DOUBLE ROLL.
MILLS: 4x8, 5x10, 6x8, 6x12 Ball. CB#4, Jeffrey 2420, Williams 4, 5 & 20 Hammer.
DRYERS: 42" x 20' w/2 shells, 5x30, 5x40, 6x50, 7x110 & 8x125.
54x70" solid bowl Bird CENTRIFUGE.
SHOVELS & DRAG: Koehring 301 & 1005, Lima 101, 604, 802 & 1201. Bucyrus 120B, 170B. NW 6, 25, 80D & 95. P&H 255, 855 & 1055. Marion 40A, 92, 93M, 381, 480 and 490. Lorain 820 20 & 45 ton std. ga. Diesel LOCOMOTIVES.
275 HP. Cummins Diesel Engine.
Equip here: 100 ton Bin, 24x32" Ball Mill, 28" x 90' Belt Conveyor.
Repres: Bonded Scale and Machine Co.
MID-CONTINENT EQUIPMENT CO., INC.
8321 Gannon St. Louis 24, Mo. Wydown 1-2826

FOR SALE
30" Superior McCulley Gyratory Crusher. Chilled C.I. Condition: Good. Price F.O.B. rails, Central Missouri—$24,000. Inspection invited.
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FOR SALE or RENT
35 ton Davenport Gas Locomotive 1942.
50 ton Whitcomb Diesel-Elec. Locomotive.
140 HP Christian 2D Diesel Hoist & Swing.
10 ton Unit #1020 Mobile Motor Crane.
25 ton Ohio Diesel Loco Crane 1947.
25 ton American Steel Guy Derrick.
30 ton Steel Stiffleg Derrick & Hoist.
100 HP Lucey Portable Firebox Boilers.
2½ yd. Manitowoc 3500 Diesel Crane 1948.
3½ yd. Lima 1201 Shovel-Dragline.
5 yd. P&H 1400 Diesel Shovel 1950.
2200 CFM C-P OCE Air Compr. 350 HP.

Mississippi Valley Equipment Co.
513 Locust St. St. Louis 1, Mo.

Dings Crockett Magnetic Separator.
Dings Magnetic Pulley 24x24 Perm. Type
Allis Chalmers R322, 3/8" throw.
Dodge Lever Type Jaw Crusher 9x15.
Reliance Jaw Crusher 10x18.
Acme Road Machy. Jaw Crusher 10x18.
Cedar Rapids Overhead Ecc. Jaw 15x36.
6—Double Roll Crushers.
6—5' and 6' Pebble mills.
Hummer Type 31 D.D. Screen 6x5.
Deister Plato D.D. Screen 4x6.
Cedar Rapids D.D. Screen 3x10.
7' x 70' Rotary Cooler.
5' x 40' Dryer, new shell.
36" x 25' Dryer, new shell.
40" x 21' Rotary Dryer, antifriction complete with hoods, etc.
16" Enc. Cont. Elevator, Chain, 55'C.
Barber-Greene 12" Bucket Loader Pneumatic, swivel conv.
Apron Feeder 18" x 11'.
Apron Feeder 18" x 5½'.
150'—22" Gravity Conveyor.
Encl. Screw Conveyor 50'x16".
Encl. Screw Conveyor 45'x16".
Encl. Screw Conveyor 84'x12".
69—36" Trough Idlers 5 roll type.
58—30" Trough Idlers Misc. types.
106—42" Trough Idlers, antifriction.
135—48" Trough Idlers, antifriction.
Rotary Feeder Valves ½ to 1½ cu. ft.
Reducers ½ H.P. to 50 H.P.
18 cu. ft. Dry Mixer with Skip Hoist
15 Ton Stiffleg, 110' Boom.
42" x 12' Air Tank ½" shell.
All sizes Conveyor Belt in stock.
Most sizes Transmission Belt.
Approx. 250 V-Belt Sheaves.

G. A. UNVERZAGT & SONS INC.
136 Colt St. Irvington, N. J.

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LOW COST—DEPENDABLE
INDUSTRIAL RUBBER PRODUCTS

call CARLYLE

FOR ALL YOUR REQUIREMENTS OF

RUBBER HOSE

Air, Acid, Paint Spray, Solvent Welding, Pile Driver, Discharge Fire, Fuel Oil, Oil Suction & Discharge, Gasoline, Suction Water, Steam, Vacuum Pneumatic, Road Builders

BELTING

Conveyor Elevator, Grader Chute Lining, Hot Material Mucker, V-Belts Transmission

PROMPT SHIPMENTS LOW COST QUALITY PRODUCTS

CARLYLE RUBBER CO., INC.
62-66 Park Place, New York 7, N.Y. Digby 9-3810

FOR SALE

TRANSIT MIXERS

Jaeger	3 Yd.	Hi-Discharge, Serial No. 3HM-J8990, un-mounted, re-conditioned @ $1,500.00
Jaeger	3 Yd.	Hi-Discharge, Serial No. 3HCS-J4680, mounted on Reo Tandem Truck @ $1,500.00
Smith	3 Yd.	Hi-Discharge, Serial No. 50337, mounted on Diamond T Tandem Axle Truck @ $1,500.00
Rex	3 Yd.	Hi-Discharge, Serial No. TD-1651, Continental power, un-mounted @ $1,500.00

MISCELLANEOUS

Gallon	"116"	Used Diesel Motor Grader @ $6000.00
Pettibone	"15"	Used 1½ Yd. Tractor-Shovel, 4-Wheel Drive @ $7000.00
American		12-Ton Used Semi Trailer, single axle @ $900.00
Unit		Shovel Attachment for Unit "314", complete @ $1500.00
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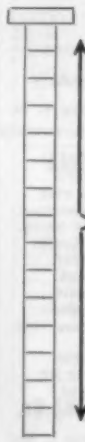

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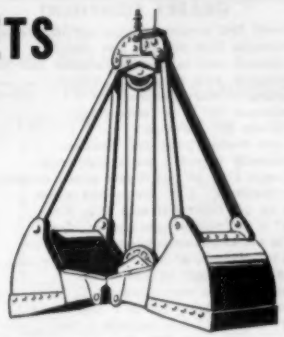

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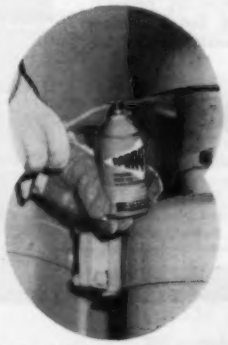

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Now! With the addition of new Hendrick Wedge Wire, Hendrick rounds out its line of screens for the best in efficient, low-cost screening, sifting, de-watering and filtering operations. New Hendrick Wedge Wire not only affords tops in dependability and performance, but it's ideal wherever it's highly important for screen openings to be minutely fine, and have excellent draining qualities yet have a high degree of accuracy and absolute rigidity. For details on Hendrick Wedge Wire's free clearance, rugged mechanical and lateral strength, maximum load carry capacity, percentage open area and long wearing life, contact your nearby Hendrick representative.

SEE OUR CATALOG IN SWEET'S

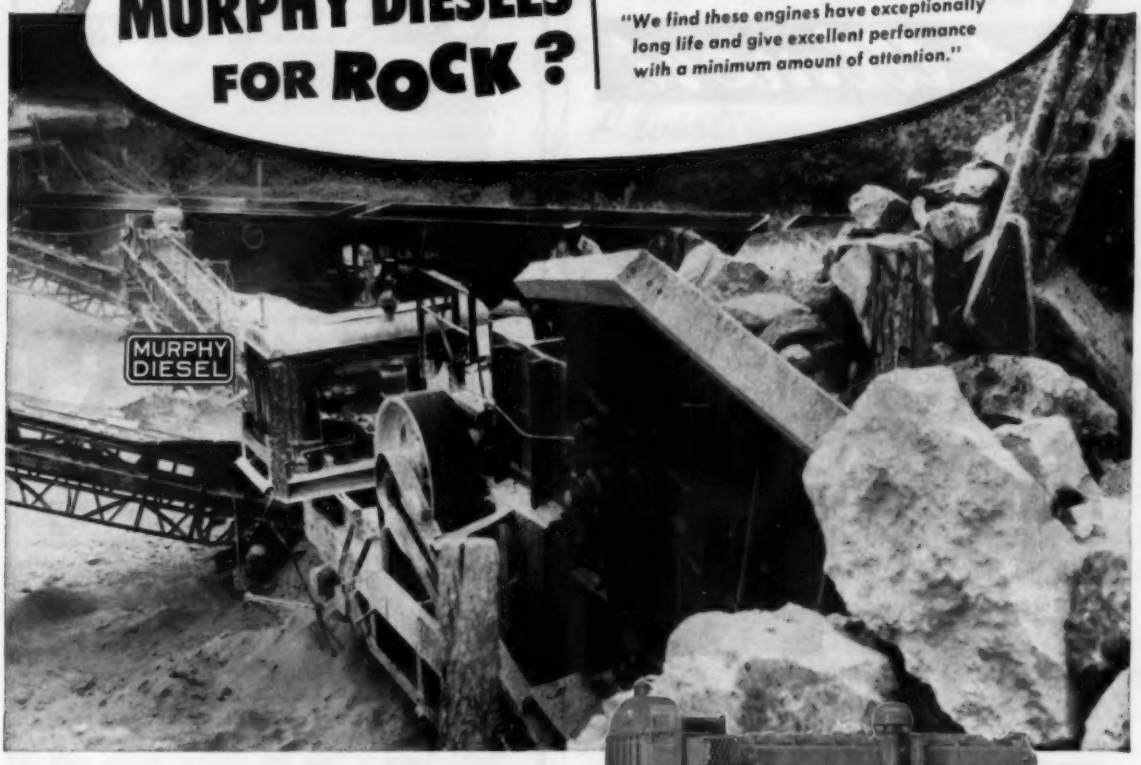
HENDRICK
MANUFACTURING COMPANY

39 Dundaff Street, Carbondale, Pa. — Sales Offices in Principal Cities
Perforated Metal • Perforated Metal Screens • Wedge Slot and Wedge Wire • Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids

HOW ABOUT MURPHY DIESELS FOR ROCK?

"Excellent," says
HAROLD S. BULLARD, Equip. Supt.
Amis Construction Co.

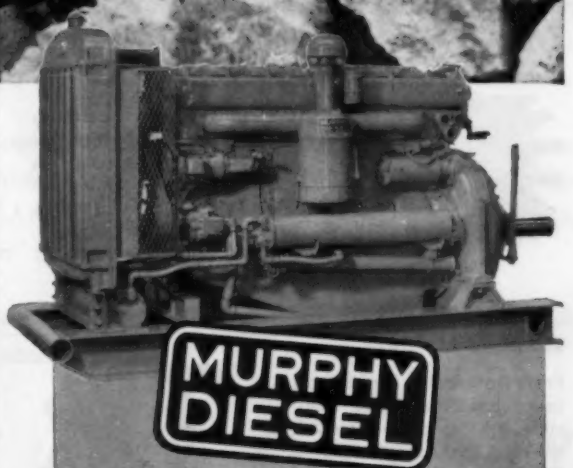
"We find these engines have exceptionally long life and give excellent performance with a minimum amount of attention."



● When we are asked about Murphy Diesels for tough rock service, we prefer to let an owner answer for us. Harold S. Bullard, Equipment Superintendent, Amis Construction Co., Oklahoma City, is well qualified to answer, too.

Amis Construction Co. bought their first Murphy Diesel years ago as original equipment on a shovel. Mr. Bullard says of this engine, *"We were very well pleased with the economy of operation and rugged dependability of this original Murphy engine and since that time have purchased other Murphys for heavy duty work in our vast operations. We now have them in use as power for rock crushers, generators, shovels and cranes."*

Here is one user's opinion. And the repeat orders remove any doubt as to his sincerity. But don't stop here. Ask other Murphy Diesel owners for their opinions, they are our best salesmen. Then ask your Murphy Diesel Dealer to show you how Murphy Diesel Power will fit into your operation.



MURPHY DIESEL

Heavy duty power
for rock crushing

Murphy Diesel Engines and Power Units are available in sizes from 96 to 264 H.P. Engine speeds are 1200 and 1400 rpm. "Packaged" generating units are available with capacities ranging from 64 to 165 K.W.

MURPHY DIESEL COMPANY
5307 W. Burnham St.
Milwaukee 14, Wisconsin
Sales, parts, service throughout the nation

333

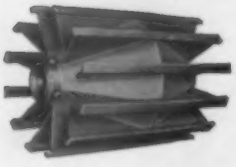
NOT QUITE FOREVER

But Almost

THAT'S THE LIFETIME OF STANDARD ELEVATING AND CONVEYING EQUIPMENT

Continuous Elevator Bucket Style #2

Put this Standard Bucket to work handling the toughest materials, and it takes the job right in stride—resisting abrasion, corrosion and wear. This bucket is typical of the complete line of low cost, rugged Standard Steel Buckets — available in Salem, Style "A," shelf type and other continuous style buckets.

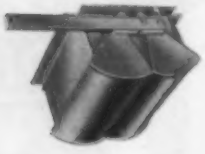


Standard Wing Type Self-Cleaning Pulley

The most severe operating conditions won't bother this Standard Pulley because its all-steel welded construction gives it far greater strength and resistance to breaking. And yet it weighs less . . . costs less.

Standard Bin Gate

Profit from faster, easier material handling made possible by this gear-operated all-steel Standard Bin Gate. Other styles in Standard Bin Gates also available.



For lower maintenance and material handling costs, convert to Standard. Write today for catalog showing the complete Standard line.

STANDARD METAL MFG. CO.
111 CENTER ST. MALINTA, OHIO

INDEX TO ADVERTISERS

A

A A Wire Products Co. 258
Adams Division, LeTourneau-Westinghouse Co. 255
Admiral Alloy Steel Corp. 368
Air Devices, Inc. 134
Ajax Flexible Coupling Co., Inc. 370
Albemarle Paper Mfg. Co. 45
Allied Steel & Tractor Products, Inc. 32
*Allis-Chalmers Mfg. Co. 13, 230-231
*Allis-Chalmers Mfg. Co., Buda Division 342
*Allis-Chalmers Mfg. Co., Tractor Division 327
American Air Compressor Corp. 350
American Brake Shoe Co. 336
American Chain & Cable Co., Inc. 196, 197
American Clay Machinery Div. of Huber-Warco Co. 277
American Crankshaft Co. 354
American Cyanamid Co. 71
American Manganese Steel Div. American Brake Shoe Co. 371
*American Steel & Wire Div., U. S. Steel Corp. 28-29, 122-123
Anaconda Wire & Cable Co., Sub. of Anaconda Copper Mining Co. 223
Armstrong-Bray Co. 347
Automotive & Aircraft Division, American Chain & Cable Co., Inc. 196

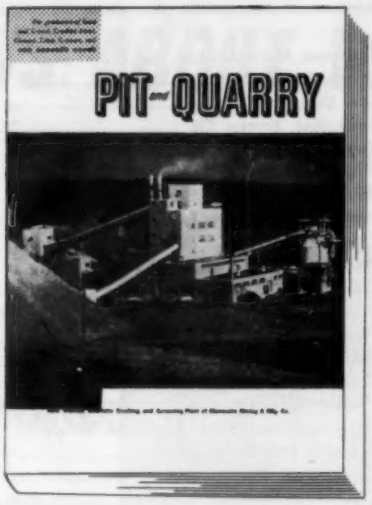
B

*Babcock & Wilcox Co. 70
*Bailey Meter Co. 67
Baldwin-Lima-Hamilton Corp. Construction-Equipment Div. 335
*Barber-Greene Co. 181
Baumann, Arthur C. 318
Bay City Shovels 328
*Bemis Bro. Bag Co. 35
*Bergen Machine & Tool Co., Inc. 269
*Besser Co. 250, 303, 313, 318
*Bethlehem Steel Co. 329
*Bin-Dicator Co. 260
*Blaw-Knox Co. 253
*Blower Application Co. 357
Bonded Scale & Machine Co. 351
Bradley Pulverizer Co. 344
Brill Equipment Co. 355
Broadcast Section 348-357
Bucyrus-Erie Company 229
*Buda Division, Allis-Chalmers Mfg. Co. 342
*Buell Engineering Co., Inc. 201

C

C & W Sales Co. 265
Cambridge Instrument Co., Inc. 368
Cape Ann Anchor & Forge Co. 206
Carlyle Rubber Co., Inc. 354

*See also Detailed Information in 1955 Pit and Quarry HANDBOOK and CONCRETE INDUSTRIES YEARBOOK.



BPA

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NBP

1956 – *40th Anniversary Year*

1955 – *15th Consecutive Year of Advertising Leadership*

1955—Our Biggest Year

Read by producers of **sand and gravel, crushed stone, cement, lime, gypsum and other nonmetallic minerals,** PIT AND QUARRY reaches every segment of the field and every type of operation.

It offers advertisers the most complete coverage of this big and basic industry whose annual output exceeds the combined tonnage of coal and all the metals.

Aggressive editorial leadership has promoted the sale of equipment by stimulating interest in more efficient methods and machinery. This is why PIT AND QUARRY remains unchallenged as the most effective advertising medium in this important basic industry.

Use PIT AND QUARRY to spark your 1956 advertising program.

During these 15 consecutive years of advertising leadership, PIT AND QUARRY has carried a total of **3,527** MORE pages of advertising than the second publication . . . an average of **235** MORE pages per year.

We deeply appreciate the confidence of our advertisers and their advertising agencies who have made this record possible.

This is proof that more industrial advertisers entrust more of their investment to PIT AND QUARRY each year because PIT AND QUARRY reaches and influences the "men of decision" in the nonmetallic minerals field.

Quality circulation and quality editorial content are an unbeatable combination.

PIT AND QUARRY

431 S. Dearborn St. **Chicago 5, Ill.**

2,055 Pages of Advertising

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NEW DEPARTURE BALL BEARING
TROUGHING IDLERS

CONVEYCO
TIMKEN ROLLER BEARING
TROUGHING IDLERS

Patent No. 2,687,799

THERE'S A SECRET TO LONGER IDLER LIFE!

It's U.S. Patent No. 2,687,799

Whatever your job conditions may be, Conveyco Idlers with sealed-for-life New Departure Bearings or Conveyco Timken Bearing Idlers will give you better performance over a longer period. The secret is in the patented construction . . . let a Conveyco engineer show you how to reduce idler maintenance.

Note: Conveyco is a convenient source for repair or replacement parts on conveying equipment. Bearings, pulleys, etc.

Call LOgan 5-8411 or write for Catalog 68 Today!

CONVEYCO

THE CONVEYOR CO.

3260 E. Slauson Ave., Los Angeles 58, Calif.

IT'S FULLY LINED

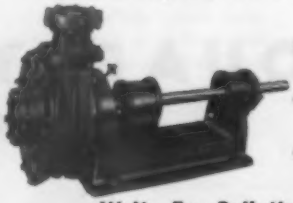
KROGH PUMPS

"YOU'LL CROW ABOUT KROGH"

SAND GRAVEL and SLURRY

You'll get more service, more production with Krogh Pumps because they are 100% lined with hard chilled alloy cast iron for maximum abrasion resistance, or alloy steel for impact strength when handling rock. Liners (available from stock) are easily installed. External wear-take-up adjustment extends operating hours. Design of Krogh Pumps makes them especially suited for handling high concentrations and maximum size particles with suction lift against high head with low rotative speed.

Proven By 80 Years Experience!



- More Capacity
- Less Wear
- More Production

Write For Bulletin No. 313-1

KROGH PUMP and Equipment Company

515 Harrison St. San Francisco, Calif.

Carpenter Manufacturing Co. 313
Carter-Waters Corp. 304
Cass Company 352
Caterpillar Tractor Co. 21, 202-203
Chase Foundry & Mfg. Co. 294
Chicago Electric Co. 357
Chicago Pneumatic Tool Co. 22
Chrysler Corporation, Industrial Engine Div. 51
Cities Service Oil Co. 41
Cleveland Vibrator Co. 192
Cleveland Wire Cloth & Mfg. Co. 228
Cleveland Worm & Gear Co. ..... Inside Back Cover
Colorado Fuel & Iron Corp. 47, 339
Columbia Machine Works 261
Columbia Southern Chemical Corp. 247
*Combustion Engineering, Inc., Raymond Division 341
Concrete Manufacturer Classified Section 316-317
*Concrete Post Form Co. 313
*Construction Machinery Co. 295
*Continental Gin Co. 239
Conveyor Company 362
Cook Bros. Equipment Co. 299
*Cross Engineering Co. 366

D

Dalrymple Gravel & Contracting Co., Inc. 353
Darden Industries, Inc., Roy 308
*Deister Concentrator Co. 46
*Deister Machine Co. 9
Dempster Brothers, Inc. 326
Des Moines Glove & Mfg. Co. 308
Detroit Diesel Engine Div. General Motors Corp. 84-85
*Diamond Iron Works, Inc. 369
*Dorr-Oliver, Inc. 345
Drott Mfg. Corp. 207
Dunn Mfg. Co., W. E. 313
Du Pont de Nemours & Co., E. I., Inc. 237
Dur-O-wal 310
Dustex Corporation 347

E

*Eagle Crusher Co. 210
*Eagle Iron Works 25
Easton Car & Construction Co. 3
*Eaton Mfg. Co. 233
Economy Forms Corp. 267
Edick Laboratories 319
Ehrsam & Sons Mfg. Co., J. B. 358
Eighmy Equipment Co. 354
Eimco Corporation 17
Elastizell Corp. of America 252
Ensign-Bickford Co. 213
Equipment Corp. of America 355
Erickson Power Lift Trucks, Inc. 279
*Euclid Division, General Motors Corp. 48-49

F

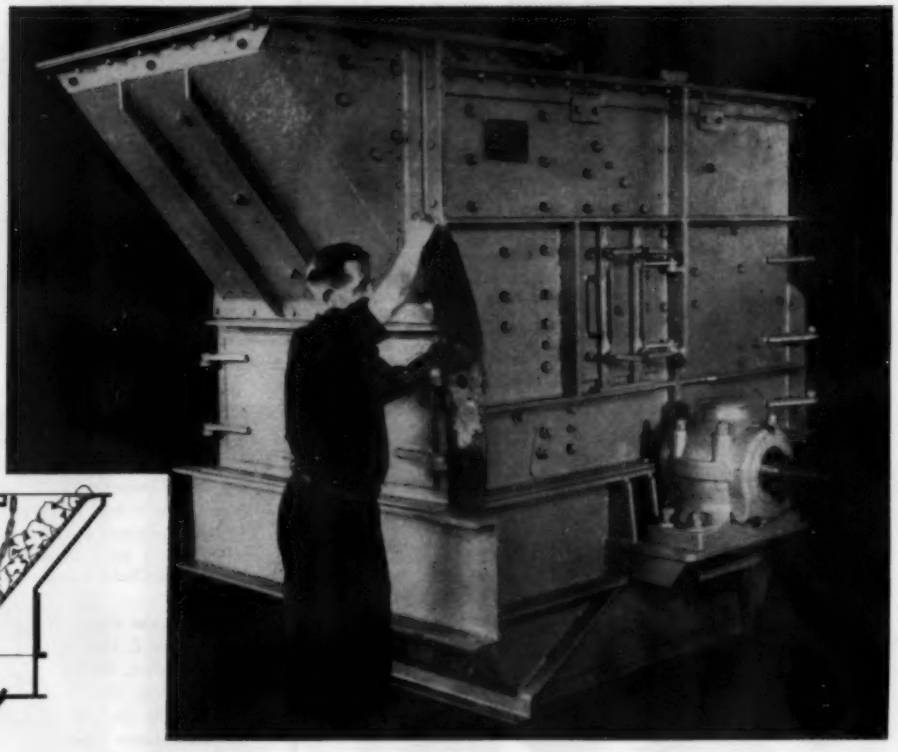
*Falk Corporation 74
*Farrel-Bacon 236
Farrell-Cheek Steel Co. 209

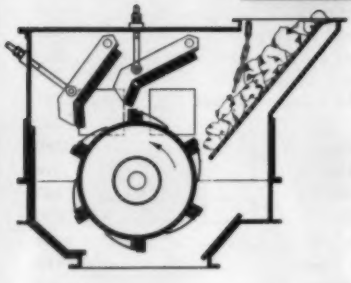
*See also Detailed Information in 1955 Pit and Quarry HANDBOOK and CONCRETE INDUSTRIES YEARBOOK.

NEWS ABOUT ROCK CRUSHERS

Over 1000 Hazemag impact crushers now installed all over the world. Cement, Lime and Gypsum mills alone account for more than 300 Hazemag impactors.

HAZEMAG
IMPACT
CRUSHERS
OPERATE
ON THIS
PRINCIPLE





Hazemag Impact Crushers are available in three types, each in a wide range of capacities:

The "BLOCKBUSTER": A primary crusher of large capacity and extremely heavy construction; with a reduction ratio so great that many materials — cement rock, gypsum, etc. — can be "double-staged", i.e. crushed from shovel size to ball mill feed in one pass, eliminating the secondary crusher.

The "RANGEMASTER": A wide-range secondary crusher with the special Hazemag "controlled fineness" feature. Close regulation of product size is possible by adjustment of blade speed and clearance: from the characteristic high fines of an impact crusher to the uniform small size and low fines now in increasing demand for heavy media separation, road aggregates, etc.

The "HISPEED": A fine-crushing impact machine, operating at very high tip speeds. May be used as a tertiary. Ideal for fiberizing and all crushing applications where impact is low and fine sizing is required.

HAZEMAG Crushers

HAZEMAG

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CUT TIME AND LABOR COSTS

on "secondary breakage"

with FREDERICK CAST semi-steel DROP BALLS

Eliminate costly, time-consuming drilling or blasting with this low-cost production tool. Rugged, durable Frederick Drop Balls provide you with quick, easy crushing power where you want it—when you want it, with little or no maintenance. Frederick's exclusive "pear-shaped" design withstands greater impact and gives straighter "pin-point" drops. Exclusive "E-Z Swing" steel eye is recessed to prevent excessive ball movement and keep hook in place. Nickel alloy is standard on balls 4000 lbs. or over—or, we'll be glad to quote on special alloys if desired.

Balls can be furnished with replaceable pins, if requested. Special release hooks for free dropping are also available.

Write today for prices and illustrated literature; send order direct or telephone.

Wide Range of Sizes and Weights:

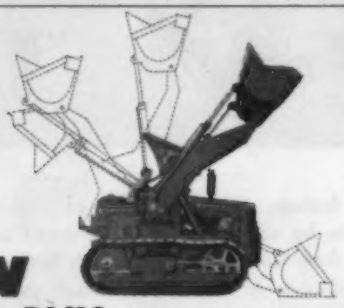
Pear shape (lbs.).....	1500	2000	3300	4000	5200	6500	8000
Ball shape (lbs.).....	500	1000	2000	5200			
Spherical shape (lbs.)..... (for magnet use)	470	950	1650	2400	3000	3700	5400

FREDERICK IRON & STEEL, INC.

FREDERICK *Established 1890* MARYLAND

Phone: MOnument 3-5111

CENTRIFUGAL PUMPS • MUNICIPAL AND GRAY IRON CASTINGS



NOW

OVERHEAD PLUS FRONT END LOADING COSTS NO MORE WITH LODOVER!

This versatile combination overhead and front-end loader costs no more than conventional front-end loaders . . . yet loads more dirt, faster with your International T-9 or TD-9 than any other loader on the market today!

ONLY LODOVER GIVES YOU

50% MORE YARDAGE—no-turn overhead operation eliminates two turns every cycle, doubles yardage every hour

EXTRA DIGGING POWER—twenty-five degree bucket tilt-back at ground level pries out a full bucket every time

REDUCED TRACTOR MAINTENANCE • SAFE, EASY HYDRAULIC OPERATION • HIGH-SPEED FRONT-END LOADING

A complete line of job-tested attachments makes Lodover the most versatile multi-purpose unit you can buy to boost profits on your job. An on-the-job Lodover demonstration will convince you . . . arrange for one today!

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20TH & ERIE AVENUE • PHILADELPHIA, PA.

Fate-Root-Heath Co. 124
Fiske Brothers Refining Co., Lubriplate Division 224
Ford Motor Co. 18-19
Forney's, Inc. 264
Frank, M. K. 355
Frederick Iron & Steel, Inc. 364
Frog, Switch & Mfg. Co. 50
*Fuller Co. 88-89

G

Gardner-Denver Co. 235
Gar Wood Industries, Inc. 188-189
General Engines Co., Inc. 317
*General Motors Corp. 48-49, 84-85
General Tire & Rubber Co. 82
Goodyear Tire & Rubber Co. 1
Gorman-Rupp Co. 60
Gulf Oil Corp. 103
Gwynne, Inc., J. H. 320

H

H & L Tooth Company 109
Hannon & Sons, F. D. 234
*Harbison-Walker Refractories Co. 215
*Hardinge Company, Inc. 44
Harmo Tire & Rubber Corp. 354
Haynes Equipment Co. 352
Hazard Wire Rope Division, American Chain & Cable Co., Inc. 197
Hazemag 363
Heat & Power Co. 350
Heidenreich, E. Lee, Jr. 348
Heineken, Inc., W. P. 353
*Hendrick Mfg. Co. 358
Hendrix Mfg. Co. 244
*Hercules Motors Corp. 68-69
Hetherington & Berner, Inc. 368
*Hoffmann Co., Geo. W. 317
Hough Co., Frank G. 179
Huber-Warco Co., American Clay Machinery Div. 277

I

Industrial Brownhoist Corp. 87
*Ingersoll-Rand Co. 227
International Harvester Co., Drott Shovels 207
International Harvester Co. Industrial Power Div. 43, 216-217
International Nickel Co. 331
International Paper Co. Bagpak Division ..... Inside Front Cover
*Iowa Manufacturing Co. 243

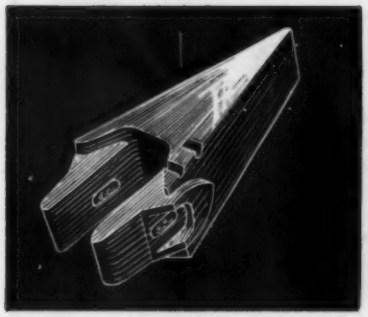
J

Jaeger Machine Co. 272-273
Jeffrey Mfg. Co. 20
Jones Concrete Machinery Co. 256
*Joy Manufacturing Co. 16

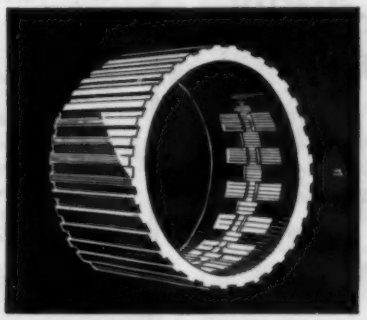
*See also Detailed Information in 1955 Pit and Quarry HANDBOOK and CONCRETE INDUSTRIES YEARBOOK.

TISCO® CAST ALLOY WEAR PARTS

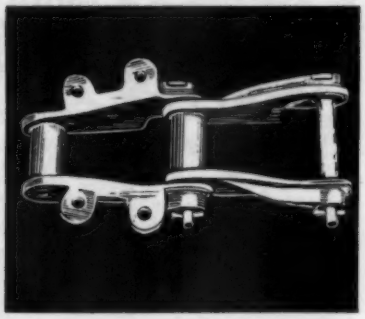
are used by leading Machinery Manufacturers



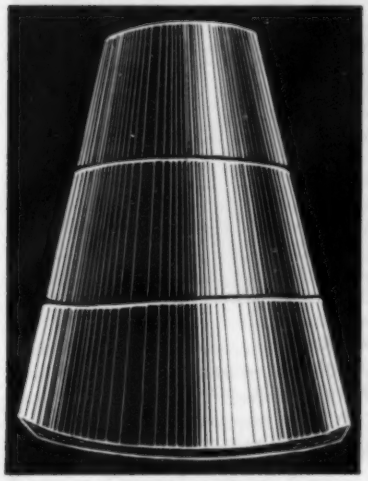
Dipper Bucket Tooth



Roll Shell

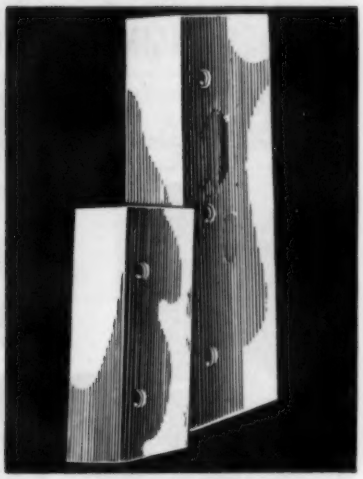


Elevator Chain



Gyratory Crusher Mantle

Hammer Mill Hammer



Ball Mill Liners

Many prominent manufacturers have profited from Taylor-Wharton's outstanding contributions to the solution of problems of impact and abrasion in the working parts of heavy duty machinery.

More than sixty years ago TISCO, the first High Manganese Steel made in the United States was introduced. It is still tops for resistance to a combination of heavy impact and abrasion. More recently, however, newer alloys of notable characteristics, more suitable for specific wear conditions, have been developed.

For example, TISCO 150-Y has strong resistance to heavy abrasion, without impact. It is excellent for extrusion augers, scraper blades, agitator blades, mixer paddles and other parts with similar wear problems. It is a high chrome cast alloy capable of heat hardening to 700 Brinell.

TISCO #50 Alloy is another useful material of outstanding abrasion resistance, and fair impact qualities. It is widely used for ball and rod mill liners, bushings and like applications. A medium manganese chrome molybdenum alloy, it can be hardened to 300-500 Brinell.

Taylor-Wharton Metallurgists are at your service. If your problem is impact or abrasion (or a combination of both) get in touch with us.

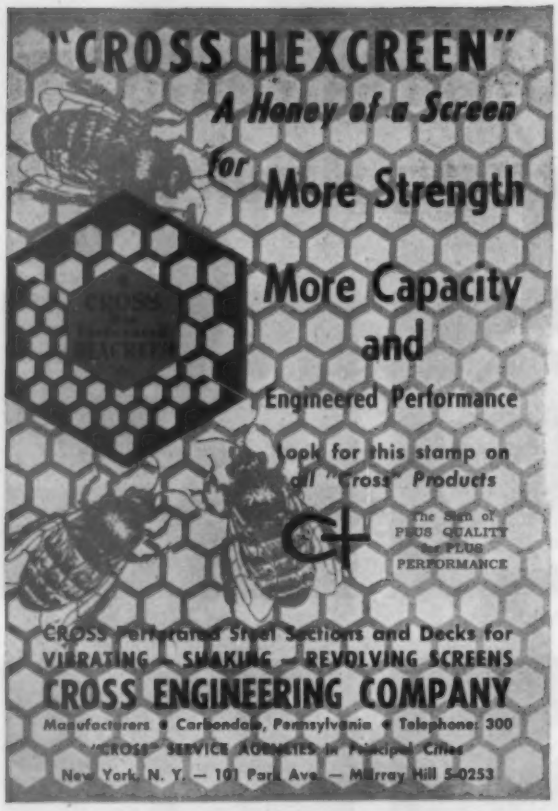
Use Timang Weld Rods and Shapes for rebuilding and repairing worn parts made of manganese steel.

TAYLOR-WHARTON DIVISION

HARRISBURG STEEL CORPORATION

HIGH BRIDGE 3, NEW JERSEY

Birmingham, Ala. Chicago, Ill. Cincinnati, O. Easton, Pa. New York, N.Y.



With a continuous record of O_2, CO_2 and Combustibles of the kiln exit-gas before him, the burner can regulate combustion to obtain maximum fuel economy, and high quality clinker production. Cambridge Gas Analyzers give him this essential record, accurately, quickly and continuously. Customers tell us that these instruments pay for themselves many times over! *Models available:* single point O_2, two point O_2 Combustibles, three point O_2-CO_2-Combustibles. *Send for literature.*

CAMBRIDGE GAS ANALYZERS

CAMBRIDGE INSTRUMENT COMPANY, INC.

3519 Grand Central Terminal, New York 17, N. Y.

PIONEER MANUFACTURERS OF PRECISION INSTRUMENTS

K

Kaiser Aluminum & Chemical Corp. 75
Kansas City Hay Press Co. 370
*Kennedy-Van Saun Mfg. & Engrg. Corp. 72-73
Kent Machine Co. 262
Kirk & Blum Mfg. Co. 260
Koehring Co. 118-119
Koppers Co., Inc. 195
*Kraft Bag Corp. ..... Back Cover
Krogh Pump Co. 362

L

Laclede-Christy Company, Div. of H. K. Porter Company, Inc. 127
LeTourneau-Westinghouse Co. 59, 61, 63
*Link-Belt Company 8, 81
*Link-Belt Speeder Corp. 57
*Lippmann Engineering Works 199
Lith-I-Bar Co. 267
Lone Star Cement Corp. 246
Lubrecht III, William 352
Lubriplate Division, Fiske Bros. Refining Co. 224

M

MacDonald Engineering Co. 221
Mace Company 310
Mack Motor Truck Corp. 219
Manhattan Rubber Div. Raybestos-Manhattan, Inc. 340
Manitowoc Engineering Corp. 205
Marion Power Shovel Co. 55
Marsh Engineering Co., E. F. 254
*Material Handling, Inc. 307
McCartney Machinery Co. 355
*McLanahan & Stone Corp. 113
McNamar Boiler & Tank Co. 52
*Meckum Engineering, Inc. 83
Medusa Portland Cement Co. 322
Memphis Equipment Co. 32
*Merrick Scale Mfg. Co. 198
Mine & Smelter Supply Co. 194
Monarch Road Machinery Co. 301
Moore Dry Kiln Co. 294
*Morris Machine Works 200
Murphy Diesel Co. 359

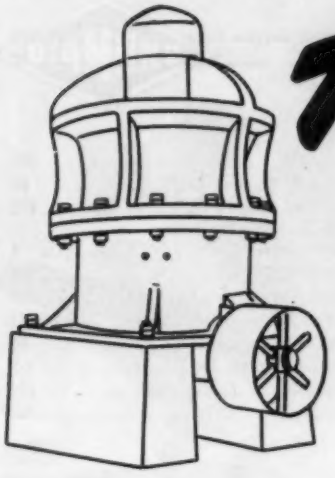
N

National Carbide Co. 354
National Wire Cloth Co. 321
*Naylor Pipe Co. 218
Neff & Fry Co. 192
Nelson Iron Works, Inc., N. P. 355
Noble Company 248
*Nordberg Manufacturing Co. 193
*Northern Blower Company 208
Northwest Engineering Co. 5
Norwalk Vault Co. 308

O

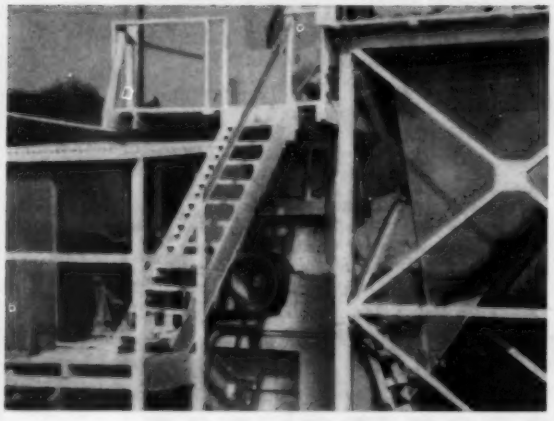
Olsen Corp., Gene 275
O'Neill, A. J. 352

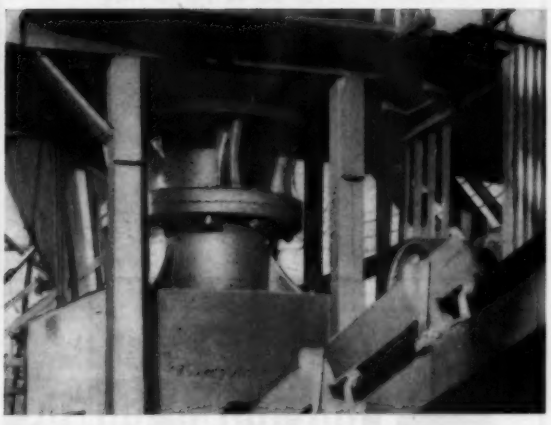
*See also Detailed Information in 1955 Pit and Quarry HANDBOOK and CONCRETE INDUSTRIES YEARBOOK.



Traylor TY GYRATORY CRUSHERS

Lead the way to Increased Profits By Lowering Your Production Costs



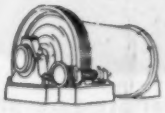


For over half a century Traylor has been designing and custom building machinery to help stone producers get more efficient production. Traylor TY Gyratory Crushers incorporate many exclusive design features developed by Traylor as a direct result of this long-standing, intimate knowledge of hard rock mining problems.

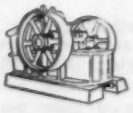
Traylor Original Curved Concaves and Bell Head feature more efficient application of power as a direct crushing force. As a result, lifting and churning of material in the crushing chamber is greatly reduced to keep waste fines to a minimum . . . to produce greater quantities of a uniform, cubical product on the initial pass through the crusher. Traylor curved crushing surfaces also reduce choking and packing because each succeeding zone in the crushing chamber is of greater capacity than the one before it. This results in much greater production at an amazingly low cost per ton produced.

Primary Gyratory Crushers

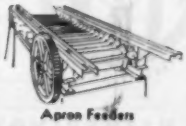
Rotary Kilns



Ball Mills



Jaw Crushers

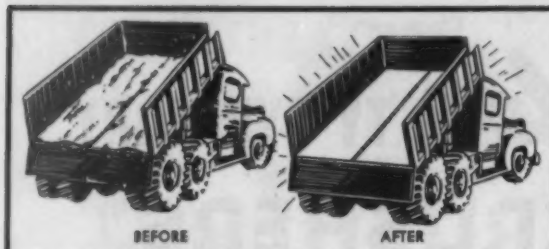


Apron Feeders

Send for copy of Traylor's Free Bulletin # 7112 which outlines complete specifications and all features of Traylor TY Gyratory Crushers.

A Traylor leads to greater profits

TRAYLOR ENGINEERING & MANUFACTURING CO.
820 MILL ST., ALLENTOWN, PA.
SALES OFFICES: New York • Chicago • San Francisco
Canadian Mfr: Canadian Vickers, Ltd., Montreal, P.Q.



ADMIRO HEAT TREATED ALLOY STEEL

CUTS MAINTENANCE COSTS

Specify Admiro Heat Treated High Tensile Alloy Steel as your best defense against severe abrasion and heavy impact. Lengthens machine service life, reduces down-time, lowers repair and maintenance costs. Available in bars and plates.

COMPLETE FABRICATING FACILITIES
Welding—Rolling—Forming
Intricate Shapes Cut to Specification

Recommended Applications:
Relining and repairing truck beds, crushers, chutes, hoppers, bins, wear liner plates, buckets, core liners, dirt and rock recovery equipment. Special uses in Mining, Quarrying, Cement and Aggregate Plants.

Write for Bulletin

ADMIRAL
ALLOY STEEL CORP.
850 Euclid Ave., Cleveland, Ohio

HETHERINGTON & BERNER

performance-proven on the toughest jobs

H&B ESTABLISHED 1887

Hetherington & Berner sand and gravel pumps are available in two general types: *STANDARD*, (4″, 6″ and 8″ sizes) with semi-steel parts, for ordinary working conditions and moderate heads; and *DREADNAUGHT*, (6″, 8″, 10″, 12″ and 15″ sizes) with manganese steel parts, for heavy duty jobs with stringent head conditions.

Write for Bulletin DP-147.

HETHERINGTON & BERNER INC.
753 Kentucky Ave. Indianapolis 7, Indiana

Oswalt Engineering Service Corp. 295
Owen Bucket Co. 42

P

*Page Engineering Co. 343
Patterson Foundry & Machine Co. 64
Penn Machinery Co., Inc., H. O. 356
*Pennsylvania Crusher Div. Bath Iron Works Corp. 4
Pennsylvania Drilling Co. 348
*Pettibone Mulliken Corp. 107
Philadelphia Gear Works, Inc. 53
Phillips Co., The Thomas 66
*Pioneer Engineering Works, Inc. 6-7
Porter Company, Inc., H. K. 91, 127
PreCaster, Inc. 265

Q

Quaker Pioneer Rubber Mills
Quaker Rubber Corp.
Divs. of H. K. Porter Company, Inc. 91
"Quick-Way" Truck Shovel Co. 130-131
Quinn Wire & Iron Works 256

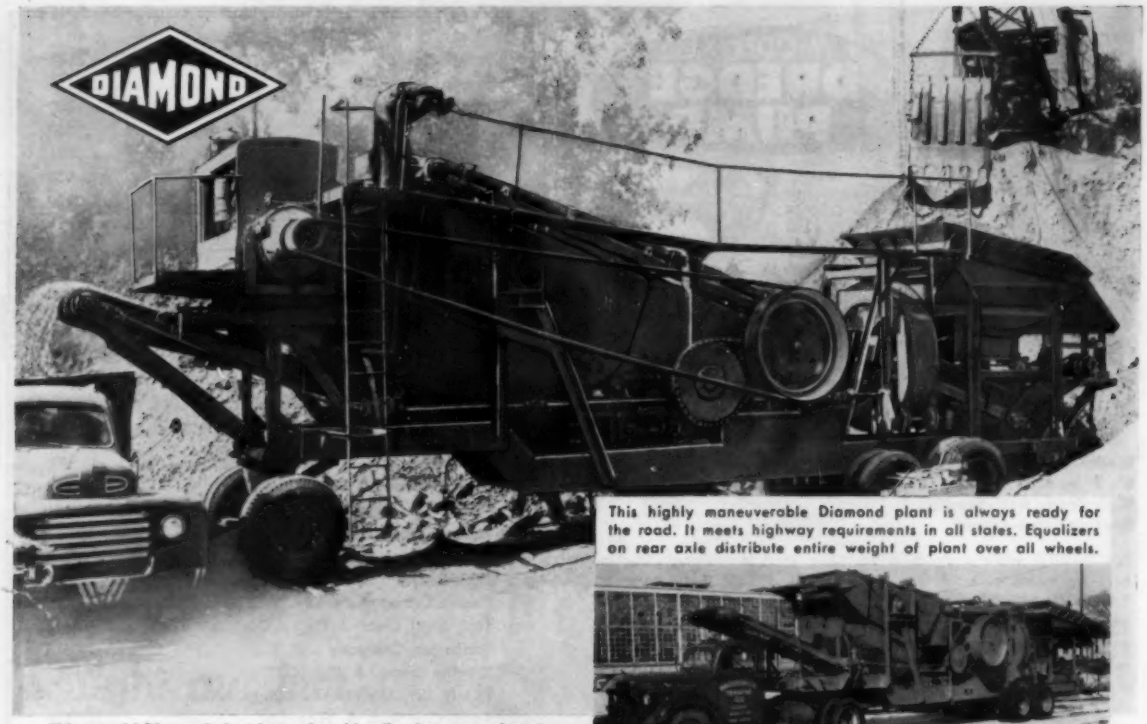
R

Radio Corporation of America 259
Raybestos-Manhattan, Inc. Manhattan Rubber Div. 340
*Raymond Div. of Combustion Engineering, Inc. 341
Reichard-Coulston, Inc. 321
Reo Motors, Inc. 76-77
Roebling's Sons Corp., J. A. 334

S

St. Lawrence Cement Co. 301
Salem Tool Co. 206
Sauerman Brothers, Inc. 38
Schaffer Poidometer Co. 222
Schield Bantam Co. 300
Scientific Concrete Service Corp. 309
*Screen Equipment Co. 225
Screen Heating Transformers, Inc. 46
Service Supply Co. 364
Shawnee Step Form Co. 308
Sheffield Steel Corp. 338
Side-O-Matic Unloader Corp. 323
Simplicity Engineering Co. 184-185
Sinclair Refining Co. 191
SKF Industries, Inc. 337
*Sly Mfg. Co., W. W. 204
*Smidth & Co., F. L. 34, 133
Smith Engineering Works 14-15
Smith, Inc., L. B. 356
*Smith Co., T. L. 284-285
Southern Tire Co. 344
Spang & Company 62
Spencer Chemical Co. 115
Spillman Co., R. L. 317
Sprague & Henwood, Inc. 58

*See also Detailed Information in 1955 Pit and Quarry HANDBOOK and CONCRETE INDUSTRIES YEARBOOK.



This type 66 Diamond plant has a shovel loading hopper equipped with a grizzly for scalping and a single eccentric plate feeder which assures continuous, regulated feeding from hopper to plant.
D-167R

This highly maneuverable Diamond plant is always ready for the road. It meets highway requirements in all states. Equalizers on rear axle distribute entire weight of plant over all wheels.

D-406

Diamond Portable Crushing Plants can increase your profits

It's a fairly simple matter to produce aggregate. But differences in crusher capacities—even within the same class—can make or break your profits.

Aggregate records of many companies prove that any one of the five Diamond primary and secondary crushing plants will not only out-produce other machines in its class . . . it regularly exceeds its own rating!

For example, Diamond's type "66" plant, with a rating of 100-125 cu. yds. per hour produced as high as 225 yards of ¾" minus road gravel per hour in various pits. And aggregate moves faster with a Diamond. A Diamond developed rotor-lift recirculates loads at higher speed and more economically than other systems for secondary crushing.

Other Diamond primary and secondary crushing plants, rated in capacity from 30 cu. yds. to 225 cu. yds., are equally efficient aggregate producers. All feature Timken roller bearing jaw crushers and roll crushers for fast, efficient crushing.

Additional Diamond features include a positive throw vibrating screen with four Timken roller bearings; a power drive with option of flat belt, V belt or spline shaft . . . and many others that aid in volume production at low cost per ton.

It's easy to see why companies that base their profits on aggregate production ability, invariably order another Diamond when expanding operations. Get full details today . . . no obligation.

DIAMOND IRON WORKS
DIVISION
GOODMAN MANUFACTURING COMPANY
Halsted Street and 48th Place—Chicago 1, Illinois

Roll Crushers • Jaw Crushers • Conveyors • Screens and Washers • Feeders and Bins • Crushing Plants for Rocks and Gravel

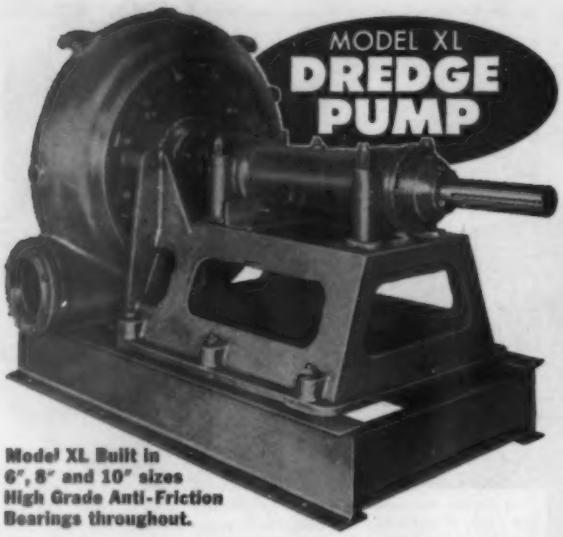
Please send your catalog No. D-104

Name and title_____

Company_____

Address_____

City_____ Zone_____ State_____



Model XL Built in 6", 8" and 10" sizes High Grade Anti-Friction Bearings throughout.

For RIGIDITY while pump is in operation, shell is mounted direct to base by means of solid, one piece casting. For GREATER PRODUCTIVITY (10-15% higher solids output than comparable pumps), EASIER MAINTENANCE (impeller replaced in hours instead of days) and ECONOMY in first cost, replacement cost and operating cost look to LIGHTNING the complete line (3" to 10").

Lightning SAND AND GRAVEL PUMPS

See your local distributor or write:

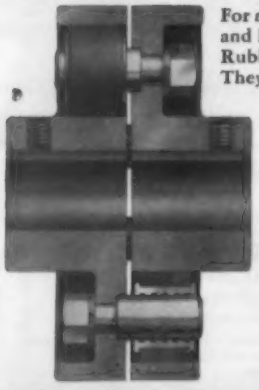
KANSAS CITY HAY PRESS COMPANY
801 Woodswether Rd., Kansas City 6, Mo.

AJAX

FLEXIBLE COUPLINGS

RUBBER-BRONZE BUSHED

Eat up **TOUGH GRAVEL YARD JOBS!**



For more dependable performance and longer service life specify Ajax Rubber-Bronze Bushed Couplings. They keep equipment operating under tough pounding, grating and abrasive conditions that exist in your diggings and yards.

Thousands of Ajax Couplings are in use on crushers, shovels, derricks, cranes, pumps and many other direct-connected machines, proving the economy of protecting good machinery with good couplings. Write for your handy Ajax Coupling Selector Guide today.

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Stanhope, Inc., R. C. 350
*Stearns Manufacturing Co., Inc. 324
Stone Products Co. 350
Stoody Co. 280
Straub Mfg. Co. 65
*Sturtevant Mill Co. 325
Sumter Electric Rewinding Co. 357
Superior Pneumatic & Manufacturing, Inc. 320
Surety Rubber Co. 321
Swabb Equipment Co., Inc., Frank 356
*Syntron Co. 220

T

Talcott, Inc., W. O. & M. W. 177
Taylor-Wharton Iron & Steel Co. 365
Texas Company 11
Thermo Stone Brick Co. 318
Thew Shovel Co. 242
Thor Power Tool Co. 39
Timken-Detroit Axle Div. 174-175
Tool Steel Gear & Pinion Co. 33
Torrington Company 333
*Traylor Engrg. & Mfg. Co. 78, 367
Trinity Div. General Portland Cement Co. 294
*Twin City Iron & Wire Co. 318
Twin Disc Clutch Co. 332
Twin Tilt Truck Co. 256
*Tyler Co., W. S. 222
Ty-Sa-Man Machine Co. 306

U

Union Wire Rope Corp. 240-241
Unit Step Form Co. 290-291
United States Rubber Co. 372
*United States Steel Co. 28-29, 79, 122-123
*Universal Engineering Corp. 107
Universal Road Machinery Co. 347
*Universal Vibrating Screen Co. 32
Unversagt & Sons, G. A. 353

V

Victor Equipment Co. 171
Virginia Gear & Machine Corp. 53

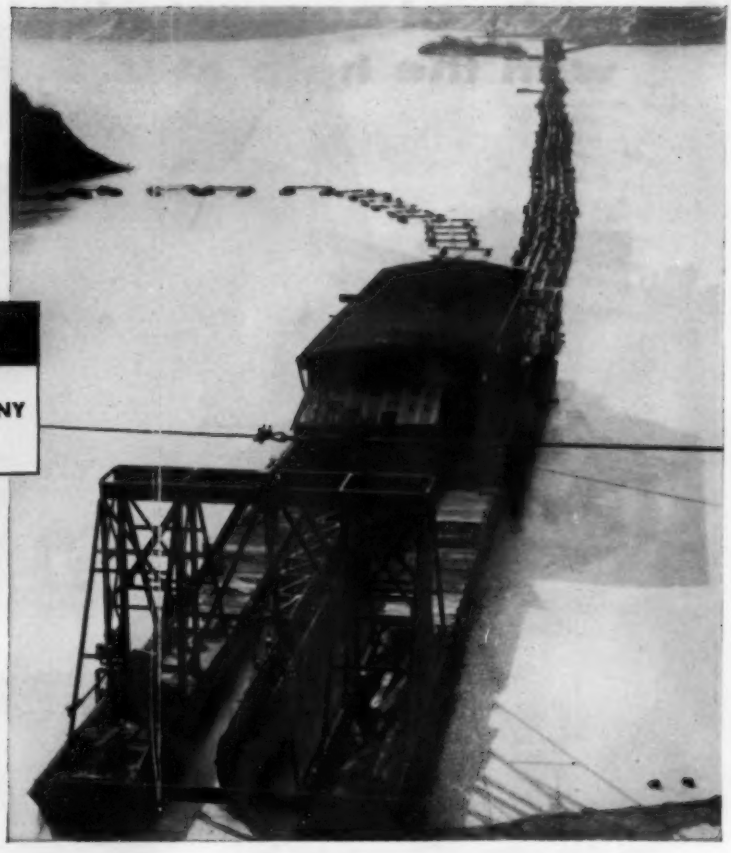
W

Webster Mfg. Co. 232
Wedge-Wire Corp. 226
Wenzel Machinery Co. 352
*Wickwire Spencer Steel Div. Colorado Fuel & Iron Corp. 339
Williams, Roger F. 310
*Wood Co., Chas. E. 330

Y

*Yuba Manufacturing Co. 214

*See also Detailed Information in 1955 Pit and Quarry HANDBOOK and CONCRETE INDUSTRIES YEARBOOK.



AMSCO PUMP APPLICATION FILE

at: THE STURM & DILLARD COMPANY
CIRCLEVILLE, OHIO

"Bought our first AMSCO® Pump 20 years ago on the recommendations of other users . . ."

"Working with Amsco Pumps has been very successful," reports George A. Fissell, Superintendent for Sturm & Dillard. "Compared to the dry digging method we used 20 years ago, it doesn't cost nearly as much, even with today's expensive labor."

Two Amsco Pumps serve this plant; the 20-year-old on the dredge is 2,000 feet from the plant and a 3-year-old on the booster is 1,200 feet from it. Their total lift is 30 feet. The Swintek ladder on the dredge works as deep as 60 feet when it's straight down, picking up a mixture of 35% sand and 65% gravel.

The shells of these Amsco Pumps are rebuilt with Amsco welding rod and Amsco shapes after a season of 1,500 hours, and replaced after the second season. Impellers also run a full season. Bearings on the 20-year-old pump were replaced just once, after ten years of service. Elbows and 45's in the pipeline are also Amsco fittings.

QUICK FACTS ABOUT AMSCO PUMPS

Whether your dredging operation is large or small, you can get an Amsco Pump for the job. There are 40 distinct Amsco Dredge Pump models—each type intended for a specific operating range. Standard sizes range from 6" to 20" discharge openings. Larger sizes are also available.

An Amsco Pump engineer will be glad to discuss your requirements. Write for Bulletin No. 1052P which includes specifications and additional information on the Amsco line of pumps.

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.

Capacity of cement plant lifted 77% with the help of U. S. Rubber belting

View of new conveyor gallery coming from No. 2 primary crusher. This cement plant uses over a mile of U.S. Belts (10 belts in all)—to handle crushed limestone rock, wet filter cake and coal.

View of U.S. Giant Style YN Conveyor Belt carrying crushed limestone rock.

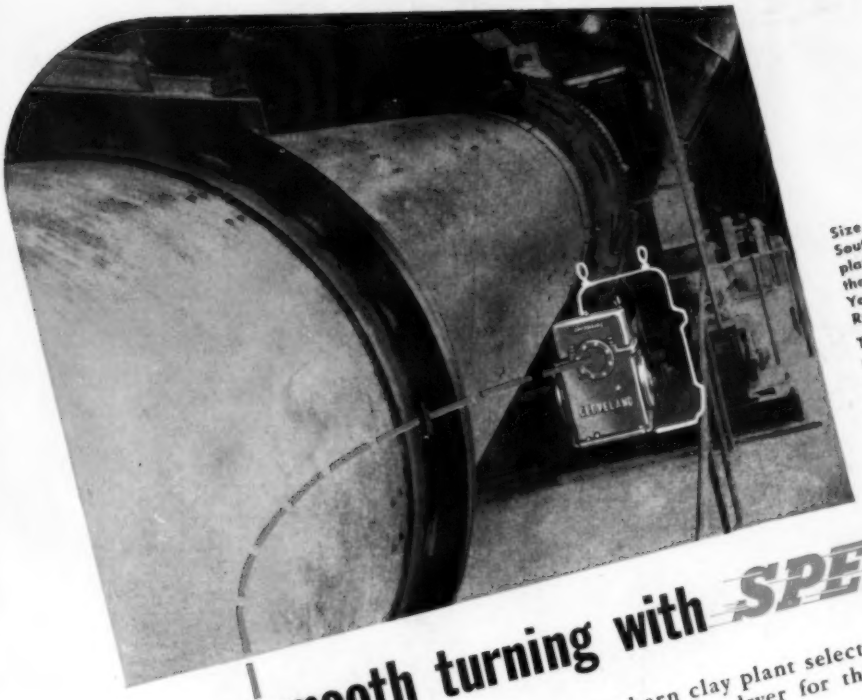
The recent expansion and modernization of a midwest cement plant lifted capacity 77%, from 4500 barrels to 8000 barrels a day. During the planning stage, United States Rubber Company's 3-Way Engineering service got on the job. By working with engineers of the conveyor system and engineers of the cement plant, the most efficient system to handle the increased capacity of the plant was designed and built. In this case "U. S." engineers recommended U. S. Giant® Style YN Conveyor Belting utilizing nylon for troughability and superior impact resistance. The "U.S." 3-Way Engineering service is available for any materials-handling problem. It is a service that will always produce an efficient low cost haulage system, whether the installation is large or small.

The "U. S." belting line contains a belt for handling any type of material. Whatever your haulage problem may be, U. S. Conveyor Belting is obtainable from any of our 27 District Sales Offices or write to us at Rockefeller Center, New York 20, N. Y.

US RUBBER

Mechanical Goods Division

United States Rubber



Size 500FA Speedaire in a South Carolina clay products plant. Photo by courtesy of the Hardinge Company, Inc., York, Pa., builder of the Ruggles-Coles dryer.

The white outline on the photograph indicates the much larger size of conventional drive required to do the work of Speedaire.

It's always smooth turning with SPEEDAIRE

THE manager of a southern clay plant selected Speedaire to drive this rotary dryer for three good reasons—

1. The fan-cooled Speedaire worm gear reducer always runs cool and smoothly under heavy loads, unaffected by heat, moisture, dust and grime.

2. Because of its smaller frame size, he was able to use Speedaire to effect a closer hook-up between the dryer shell and the motor. As this photograph shows, space is at a premium here.

3. Speedaire saved him $733 over the cost of a conventional drive of equivalent capacity.

Speedaire is built especially for tough jobs like this. Scores of units, large and small, are in service in the rock products industries. If you aren't familiar with Speedaire, and want to save headaches and money when you buy your next speed reducer, call on us. Just write and ask for a copy of Catalog 300. The Cleveland Worm and Gear Co., 3280 East 80th St., Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication.
In Canada: Peacock Brothers Limited.

CLEVELAND
Worm Gear
Speed Reducers

Your best assurance for a *continuous* supply is a completely integrated supplier!

Kraft Bag Corporation comes closest to being the most completely integrated manufacturer of multiwall shipping sacks in the industry!

Check this chart and see for yourself why Kraft Bag Corporation should be your supplier!

Tell us when we may call to discuss your requirements.

FEATURES	KRAFT BAG CORPORATION	OTHER SOURCES ?
Forest Lands	✓	
Pulp Mill	✓	
Bleach Plant	✓	
Paper Mill	✓	
Multiple Bag Plants	✓	
Natural Kraft	✓	
Colored Kraft	✓	
Bleached Kraft	✓	
Creped Kraft	✓	
Wax Laminated Kraft	✓	
Asphalt Laminated Kraft	✓	
Wet-Strength Kraft	✓	
Water Repellent Kraft	✓	
Stak-LOK Super Rough Kraft	✓	
Valve Bags—sewn or pasted	✓	
Open Mouth Bags—sewn or pasted	✓	
Flat Sewn Valve Bags	✓	
Flat Sewn Open Mouth Bags	✓	
KRAFT-lok Valve Closure	✓	
Creped Tape	✓	
Gummed Tape	✓	
Filter Cord	✓	
Sewing Thread—(the only material we do not produce ourselves)		
1-2-3-4 Color Printing	✓	
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Bag Development and Research	✓	

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Exclusive Sales Agents for Kraftpacker Automatic Open Mouth Bag Filling Machi

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